# Southwestern Medicine

OFFICIAL ORGAN OF
ARIZONA STATE MEDICAL ASSOCIATION — NEW MEXICO MEDICAL SOCIETY
EL PASO COUNTY (TEXAS) MEDICAL SOCIETY — THE SOUTHWESTERN MEDICAL ASSOCIATION

Vol. XXII. EL PASO, TEXAS, OCTOBER, 1938 No. 10


## Surgical Shock


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AN editorial by Samuel Harvey in the S. G. and O[1] stated that there is no such thing as shock; that it is a more or less obsolete term used as a substitute for an unknown diagnosis; that, if shock is cardiac failure or circulatory failure, why not call it that instead of the much abused term of shock. Perhaps there is some truth in this man's statements that the term is overworked, but be that as it may, there certainly is a clinical condition frequently met with in medicine and surgery that has been known for many years as shock, and will no doubt be so termed for centuries to come. Ambroise Pare, John Hunter, Sir Astley Cooper and many other of the medical writers of the past certainly recognized the condition but discussed it under the title of inflammation or irritation.[2] Credit for being the first to actually employ the term of shock is divided between two men. Some historians say that James Latta in 1795 was the first, while others give credit to Benjamin Travers, a London physician of the early 19th century. The latter wrote a book entitled, "Constitutional Irritation,"[3] in which he spoke of the symptom-complex of shock. However, much of the modern understanding of shock dates back only to the Great War.

By shock of course, we mean that state of profound mental and physical depression which may result from severe physical injury or an emotional disturbance.[4] Or perhaps better and at least more descriptive medically, it is that condition in which there is a more or less paralysis of the sensory and motor portions of the reflex arc, along with profound disturbances in the circulatory system, subnormal temperature, shallow respiration, etc.[5]

The signs and symptoms of shock are usually very characteristic, and may be enumerated in two groups, as follows: First, those readily detectable by observation, namely—(a) pallor, sometimes associated with slight cyanosis, (b) cold, moist, sweaty skin, (c) rapid, regular but thready pulse, (d) rapid, usually shallow respiration, (e) restlessness and anxiety which may change under unfavorable circumstances to dullness and lessened sensitivity, (f) thirst, and (g) a variable amount of nausea and sometimes vomiting.

Second, those signs or states detectable by the use of simple instruments or more complicateed examinations, namely; (a) subnormal temperature, (b) low and falling blood pressure, (c) diminished blood volume, (d) reduction in blood alkali, (e) lowered metabolism, etc.[5]

### TYPES

The types of shock are varied[5] First, we have gravity shock in which, because of stagnation of blood in the splanchnic vessels, there is a consequent inadequate filling of the heart in diastole, with resultant shock. Second, there is hemorrhagic shock, in which because of the hemorrhage there is a deficient diastolic filling of the heart as in gravity shock. Third, anesthetic shock in which, when too much anesthesia is used there is apparently some disturbance caused to the blood pressure reflexes which allows shock. Fourth, spinal shock in which, after severe nerve tissue trauma there is an interruption in the normal nervous reflex pathways. Fifth, toxic shock, in which the depression is the response to some toxic or sensitive agent as in anaphylaxis, the absorption of toxin from a peritonitis, etc. Sixth, nervous shock or shell shock, which was seen frequently in war days but which is met with very infrequently now. Finally, surgical shock which is the variety usually referred to when one speaks of shock and the one about which we wish to speak tonight.

Before going on with the discussion of surgical shock, however, I wish just to mention another classification of shock. This involves the division of shock into the primary and secondary types. By primary shock we usually refer to that due to a sudden trauma, as in the perforation of a gastric ulcer into the peritoneal cavity, causing severe afferent nerve stimulation, while by secondary shock we refer to that which perhaps may have been started by some trauma but which comes on later as the result of the absorption of poisons or toxins which directly effect the higher nerve centers.[5]

### ETIOLOGY

The etiology of surgical shock is usually obvious. It may be caused either by severe mechanical injury to a healthy person or by extensive manipulation and rough handling at the operating table. It occurs most frequently in every day life by extensive severe crushing wounds, by fractures to large bones,[5] and by all such accidents that cause much tissue damage or produce much hemorrhage.

### MECHANISM OF SHOCK

The physiology or mechanism of shock is still a

subject of considerable discussion, and many widely differing opinions are held. I will not attempt to enumerate all the various theories that have been or are propounded, but will merely mention three or four of the more common and most widely accepted theories. First is the Vasomotor or nervous conception of shock, which holds that as a result of the stimulus which occurred to produce the shock there is a reflex slowing or stoppage of the heart, a fatiguing of the Vasomotor center, with splanchnic dilation, lowered blood pressure and shock. This is the theory held by Crile. Then there is the conception of "Failure of Venous Return", held by Henderson and his collaborators, that as a result of the initial stimuuli there is a failure of the venopressor mechanism (which they say is not vasomotor but is simply the general tone of the skeletal muscles all over the body, and especially those of the abdomen and diaphragm, pressing upon the capillaries and venules, and squeezing the blood back towards the right heart- with resultant decrease of blood to the right side of the heart, or because of hemorrhage a decreased venous return; then by Starlings law, there is less blood pumped from the heart, hence thready pulse, and resultant shock. They prove their theory by increasing the venous return to the heart by transfusions or intravenous infusions and hence stop the shock. More recent is the acapnia theory also proposed by Henderson, which has to do with the physiology of respiration. According to this conception the characteristic disturbances of shock are largely due to the development of a deficiency of carbon dioxide in the blood and tissues of the body. Cannon and others have showed by analysis an actual lowering of the $CO_2$ content, and they use as their arguments the prevention of shock on the operating table, during anesthetics, post operatively, etc., by the use of $CO_2$ inhalations.

Then of course, there is the toxic absorption theory; and the nervous reflex theory; and still another more recently proposed mechanism is that of "a decrease in the effective circulatory volume." "This, so far as is known," says Dr. Walter J, Meek[12], the professor of Physiology at the University of Wisconsin, "is the common casual factor in all forms of shock." In his discussion he says that blood volume may be reduced not only by hemorrhage and tissue and capillary damage, and etc., but also by dehydration and dechlorination of tissues. He and his fellow worker, Herrin, did a rather ingenious laboratory experiment to arrive at their findings. They isolated a loop of bowel from a laboratory dog and obstructed it mechanically outside of the peritoneal cavity. The dog soon became toxic and went into shock. The same operation was done upon another dog, but this time the nerves to the obstructed loop of bowel were severed, and this time the dog did not develop shock. The difference they found was that with the nerves intact the distended loop of bowel secreted much blood plasma and hence loss of both fluid and salt, while when the nerves were severed the above secretory loss seemed to be easily compensated for. as the dog remained well and did not show the dehydration and loss of chlorides. These experimental findings would then tend to disprove any toxic absorption theory, but certainly adds weight to the nervous responsibility.

But whether surgical shock is due to splanchnic dilatation and stagnation, to a failure in the venopressor mechanism, to a decrease in the effective circulatory volume, to toxic absorption, to nervous reflex, or to a combination of these and perhaps others, only much further physiological experimentation will tell. In any case the primary interest of we, as medical and surgical practitioners, is not its mechanism, but the prompt recognition and treatment of shock.

## DIAGNOSIS

The diagnosis of surgical shock, although usually obvious with its so-called cardinal symptoms of (a) pallor, (b) cold leaky skin, (c) rapid, thready pulse, (d) shallow respirations, (e) low blood pressure, (f) and partial to total loss of consciousness, must nevertheless be differentiated from other conditions in which there are pallor, and rapid, weak pulse. The most important of these other conditions is, of course, hemorrhage, and the differentiation between post operative shock and post operative hemorrhage is sometimes a most difficult task. Babcock[3] says "Hemorrhage is followed by pallor of the skin and mucous membranes, air hunger, the respiration becoming quick, gasping, and sighing; the pulse, at first not affected, later becomes progressively more rapid, small and weak; the skin is cold with a free clammy sweat; the temperature subnormal; there is restlessness, thirst, dimness of vision, syncope, and noises in the ears. The blood shows a leukocytosis of 15,000 to 30,000 and a diminution of red blood cells and hemoglobin. In shock there is a concentration of blood, a relative increase of hemoglobin and corpuscles, an absence of leukocytosis; air hunger is less marked, restlessness less common, and the patient is more often unconscious."

## TREATMENT

In the treatment of shock, the first point to be considered is prophylaxis. Of course prophylaxis against industrial accidents, transportatoin hazards, etc., have their place, but we will not speak of them in this paper. Instead we will confine our words to measures that may be applied in the home and in the hospital. Even a lay person, following accidents of a more or less serious nature, can get the patient in a horizontal position, apply external heat, give fluids by mouth if tolerated, control hemorrhage (by tourniquet or pressure) if necessary, help to alleviate pain, splint a broken limb, etc.; any or all of which may prevent shock from developing. However, in the hospital in operative procedures is where most preventative work can be done. The operating room should be kept warm, and the patient should come to the operating table as nearly properly prepared as possible. This latter preparation may involve a number of points. If

fluids have been lost by vomiting or diarrhea, they should be replaced by intravenous infusions, hypodermoclysis or protoclysis. The fear element should have been controlled by reassurance and by proper sedation. Then as to the actual operation, there are a number of most important points to keep in mind. First, the anesthetic should be skillfully given and should be as light and as short a duration as possible. This latter statement must not be taken too literally, because we all know that in intra-abdomnial work proper relaxation by a little deeper anesthesia will prevent much tissue trauma. Second, blood loss should be kept at a minimum by careful hemostasis, and finally tissue damage should be minimized by gentle retraction, careful application of hemostats, use of warm moist sponges, and by the manipulation of the viscera as little as possible. Following operation, warm blankets, alleviation of pain, $CO_2$ and $O_2$ inhalations, and the administration of fluids parenterally will usually prevent most post operative shock.

If one's prophylactic measures, however, have been unsuccessful, or if shock is already present, when the patient is first seen, then active treatment[9] by all or any of the following procedures must be started at once: (a) elevate the foot of the bed, so that the blood from the decreased cardiac output may, by gravity, be aided in reaching the more vital nervous centers at the base of the brain, (b) application of external heat, by warm blankets, hot water bottles, electric pads, etc., (c) perhaps the best single method is the administration of fluids to restore the decreased volume return to the heart. Of this group of possibilities, blood transfusion, if available, is best, and then if blood is not available, glucose and saline, or gum acacia, or 10 per cent ethyl alcohol in 10 per cent glucose by vein,[10] and saline by hypodermoclysis or proctoclysis. (d) Finally a number of drugs that may and probably will prove of benefit are: adrenalin, 5 to 15 M hypodermically or intravenously in an emergency, Caffeine Sodium benzoate 7½ grs. hypodermically. Neo-synephrin hydrochloride, 5 mgm. subcutaneously,[11] aromatic spirits of ammonia by inhalation and a number of others.

In conclusion, we wish to state that whether shock is due to circulatory failure or to vasomotor sympathetic stimulation, or to some depressed metabolism, it certainly is a very definite clinical entity, and its prophylaxis and its prompt recognition and treatment have done much to further the modern day advance in surgery.

## SUMMARY

1. Shock in general is presented as a frequent clinical entity, and then the more common types of shock are enumerated.

2. Surgical shock is then discussed as to its etiology, the theories of its mechanism, its symptoms, diagnosis and treatment.

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# Management of Bowel Obstruction

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IT is impossible to present the subject of bowel obstruction in all its phases in the time allotted me. Therefore, an attempt will be made to relate some of the more practical aspects of diagnosis and therapy, and some of the later conceptions brought forth by various investigators.

Since the advent of the aseptic era of surgery, much has been learned concerning the nature of intestinal obstruction. Much remains to be learned, and a satisfactory therapeutic solution is not directly at hand. This is made apparent by the fear caused in both patients and physicians at the mention of the presence of intestinal obstruction. There is adequate reason for such fear when one views the published mortality rates. This is as true as it was fifty years ago. Even though some improvement in this interval is evident, there is no justification for optimism, because the hazards of obstruction continue to be real.

In 1912, Hartwell and Hoguet prolonged the lives of dogs with high intestinal obstruction by administration of saline solution. This agent lent impetus to the work of the clinicians, and they promptly found, as McIver has recently indicated (1934), that the mortality of bowel obstruction is not influenced by its use.

The experiments of early investigators indicated that death in bowel obstruction was largely due to a toxic factor. The experiments in the past decade have pointed more directly to mechanical agents—such as loss of fluid by vomiting, interference with absorption by distension, and other affects upon bowel wall and its blood flow which might favor abnormal absorption.

In order to better understand the factors which contribute to the continuation of intestinal obstruc-

Read before New Mexico State Medical Society, Santa Fe, New Mexico, June 6, 7 and 8, 1938.

tion as a serious menace, it is necessary to clarify the issues which appear to have such an important bearing upon the problem.

The significance of fluid loss, especially in high obstructions, has been adequately evaluated. It is highly important to select the most expedient agents in the relief of bowel obstruction.

In June of 1892, surgery of the gastro intestinal tract, especially for the relief of obstructions, was revolutionized by J. B. Murphy with his invention of the intestinal button. Thus, a whole field of surgery was cleared by Murphy and throughout the world interest in the surgery of the intestines was aroused. Surgeons in large numbers began to invade the gastro-intestinal tract, with the resulting simplification of anastamosis as it is practiced today. Even today, Murphy's button is used by highly skilled surgeons when the situation demands a simple, rapid union where anastamosis by sutures is well-nigh impossible.

## RECOGNITION OF OBSTRUCTION

In the successful management of bowel obstruction, the first important consideration is recognition of early cases. Not so long ago, one merely satisfied himself that an acute abdominal lesion was present, and then resorted to exploratory laparotomy to determine its exact nature. Its repair became an incident of the operation. This aggressive spirit of the surgeon aided the correlation of symptoms with findings—such that today fairly definite syndromes are known to characterize most acute abdominal lesions which are typical in their behavior. The development of roentgenology has been a great boon in lending greater certainty and assurance to the correct pre-operative identification of two important and common acute abdominal lesions, viz: perforation of the gastro-intestinal tract, and bowel obstruction. Negative evidence obtained by radiographic examinations with reference to the problematic presence of these two conditions is equally valuable in establishing the true nature of the acute abdominal disorder under consideration.

Before proceeding with the management of intestinal obstruction, one must consider the following points:

1. Is bowel obstruction present?
2. Where is the obstruction?
3. What type of obstruction is present?
4. The affects of the obstruction.

The usual complaints of a patient with bowel obstruction are:

1. Recurrent intermittent crampy pain.
2. Nausea and vomting.
3. Distension.

The presence of intestinal colic is established by the occurrence of intestinal borborygmi, heard with the stethoscope at the height of the pain. It is the constant and intimate relationship between noise and pain which is significant. No other acute lesion of the abdomen is characterized by such a pathognomonic finding. When other conditions, such as enterocolitis and food indiscretions, have been eliminated, the occurrence of intestinal colic in a patient with distension is indicative of the probable presence of bowel obstruction.

Essential for the recognition, as well as the treatment, of obstruction, is the significance of the ileocecal sphincter and valve. This involuntary ring of muscle together with the lips of the valve obviate regurgitation from the colon into the small intestine in mechanical obstructions of the large bowel; yet it permits free entry of gas and fluid from the small intestine into the large. Vomiting in obstruction of the small bowel is ordinarily copious and frequent. In colonic obstructions, vomiting is often absent altogether, despite enormous distension.

When a duodenal tube is passed into the stomach in obstructions of the small bowel, stercoraceous intestinal content is almost invariably obtained—gastric retention in colonic obstructions does not occur. Fecal-like vomiting, or the aspiration of stercoraceous material from the stomach occurs only in obstructions of the small intestine; never in uncomplicated colonic occlusions. A malignancy of the cecum occluding the ileo cecal sphincter behaves, of course, like an obstruction of the small intestine.

## USE OF X-RAY

In establishing the site of the obstruction, X-ray examination is most valuable. When the exposure is made on a large film with the patient lying supine, the contour and distribution of the distended intestinal coils can be followed through. Barium should not be given and is not necessary for diagnosis. In mechanical obstructions of the large bowel, the distension is limited to the colon. In occlusions of the small bowel, the gas distended segments can usually be readily identified as being small intestine from their location and pattern. The distended jejunum can often be distinguished from ileum, because the more numerous mucosal folds in the jejunum afford a feathery appearance, as contrasted with the smoother outline of the ileum. There are, of course, instances in which one can not be wholly certain as to whether a given area of distension concerns the colon or small intestine. It is particularly in partial obstructions of the small bowel, in which gas finds its way beyond the site of obstruction, and in physiologic obstructions that this differentiation occasionally proves difficult. Gas, it is to be remembered, is present throughout the intestinal canal. On an X-ray film of the adult's abdomen, however, gas is only normally visualized where food or intestinal content remains for some time. Gaseous distension of the small intestine is therefore synonymous with intestinal stasis.

In the infant's abdomen, however, gas is normally visualized in the small intestine up until the third year of life.

Diagnosis of bowel obstruction made by the roentgenologist may prove misleading. It is highly important that careful integration be made between clinical and X-ray findings. Clinicians who accept

the impressions of a roentgenologist with reference to the significance of distended intestinal coils as irrevocable conclusions will perform unnecessary operations for the relief of conjectured obstructions unless they temper these interpretations with the leaven of clinical findings. A critical co-ordination of roentgen findings and clinical observations will yield a reliable judgment. Precise diagnosis, without resort to X-ray examination, is impossible. Roentgen interpretation, without knowledge of the clinical findings, are untrustworthy.

## DIFFERENTIAL DIAGNOSIS

Several types of bowel obstruction present in the clinical findings so typical a picture that they are easily recognized—as, for example: strangulated external hernia, intussusception in infants, and imperforation of the rectum and anus. Intestinal atresia of the new-born, and obstructions of the colon can also be quite accurately identified with the aid of a scout film of the abdomen.

Physiologic obstructions are to be identified by the absence of intestinal colic; the abdomen is usually silent; crampy pain is not complained of. Usually, distension occurs in both the large and small bowel as visualized in the X-ray film. There are, however, certain obstructions, such as intestinal intussusception and obstruction due to presence of a gall stone in the bowel, which are notably difficult to recognize correctly before operation.

Strangulating obstructions are to be differentiated from simple occlusions by the presence of signs of irritation of the parietal peritoneum.

In obstructions presenting only interference with intestinal continuity, abdominal tenderness is usually absent; whereas, when sanguineous fluid escapes into the peritoneal cavity, due to interference with venous return from the constricted loop, rebound tenderness can be demonstrated.

Before proceeding any farther, it is necessary to say something concerning water balance of the body.

## WATER BALANCE

Water balance is the ratio between the total intake of water by ingestion by all possible means and the total excretion of water by all routes, including the kidneys, lungs, skin, bowel, or any abnormal route, such as biliary fistulae, intestinal fistulae, etc. Any rational management of fluids—both before and after operation—must be planned on this basis. Each case should be considered individually with respect to individual requirements to balance intake and output with regard to the manner of administration and the nature of the fluid to be given. The dehydrated patient is a poor surgical risk, and operation should always be postponed until the fluid loss is overcome.

It is essential to know something about the physiologic factors involved in water metabolism, in order to successfully manage water balance in abnormal conditions.

Water makes up about 70% of the body weight. It is contained in three reservoirs:

1. The blood.
2. The interstitial areas between the cells.
3. The cells themselves.

The fluid contained in the blood, and that in the interstitial areas of the subcutaneous tissues and between the muscle cells, is the more readily mobilized in the event that the reserve supply of water is called upon.

The fluid in each of these reservoirs contains a constant concentration of salt which cannot vary except within very narrow limits. This concentration is equivalent to 0.9 per cent sodium chloride—the familiar physiologic saline solution.

Sodium chloride and sodium bicarbonate are the important salts in the blood plasma and interstitial fluids.

Within the cells, the chief ions are those of potassium and phosphate.

Disturbances in the relative concentration of these salts are concerned with Acidosis and Alkalosis.

The kidney maintains a constant volume of fluid in the blood and a constant composition of its various chemical components. If too much salt is ingested by the organism, the normal kidney promptly excretes the excess. If the body fluids are too acid or alkaline, the kidney then aids in restoring the balance by forming an alkaline or acid urine as needed.

The amount of water excreted into the gastro-intestinal tract as saliva, gastric juice, bile pancreatic juice and succus entericus has been estimated by Rowntree to be from 7500 to 10,000 c.c. daily. Under normal circumstances, this fluid is reabsorbed. This gastro-intestinal circulation represents two or three times the average quantity of fluid taken by mouth in 24 hours, and three to four times the quantity of urine excreted in a similar period. The daily intake of two to three liters is only a small portion of the total amount of fluid absorbed daily. Disturbances in this gastro-intestinal circulation—such as occur in vomiting, intestinal fistulae, diarrhea—are of the greatest importance to the surgeon. A large amount of fluid may be lost by vomiting. If the vomiting is at all protracted, not only is the fluid by mouth lost, but also relatively large amounts of the fluid secreted into the upper portion of the small intestine.

The presence of dehydration can best be determined by a simple clinical observation. The familiar signs are: sunken facial expression, dryness of the buccal mucosa and tongue, turgidity of the skin, marked subjective thirst. The temperature may be elevated, due to inability of the sweat glands to excrete enough perspiration to control body temperature. Laboratory proof of dehydration is shown by a concentrated urinary output, a high non-protein nitrogen content of the flood, a relatively high red cell count and hemoglobin content, increased concentration of plasma proteins and a decrease in the plasma volume (normal, 50 c.c. per kilogram of body weight). If the dehydration is due to vomiting, the blood chloride will be at a low level. A high $CO_2$ combining power indicates alkalosis. Acidosis is shown by a low $CO_2$ combining

power and sometimes by an increase in the blood chloride.

As a result of copious and regurgitant vomiting, obstruction of the small bowel—and particularly if it is high up—is associated with the loss of considerable fluid. With this loss of fluid, there is also an essential escape of electrolytes. Experimentally, saline solution has proved to be a satisfactory antidote for these fluid losses. The liberal paraoral administration of saline solution also clears away the chemical alterations in the blood noted in high obstructions of the small bowel, viz.: elevation of the non-protein blood nitrogen, decrease of the blood chlorides, and an increase in the carbondioxide combining power of the blood (alkalosis). As stated before, it has been estimated that 7,000 c.c. of fluid are secreted daily under normal conditions into the intestinal canal. The source for serious and profuse fluid loss in obstructions of the small bowel, therefore, becomes apparent. In obstructions of the colon, on the contrary, in which vomiting is often absent, fluid loss is not serious.

## MECHANISM OF OBSTRUCTION

With interference of intestinal continuity, the increased volume of the bowel content raises the pressure within the bowel. The long continued sustained intra-intestinal pressure upon the bowel wall produces the following consequences:

1. Absorption from the bowel lumen is decreased.
2. The blood supply of bowel wall is interfered with, threatening the viability of the gut if the increased intra-intestinal pressure is not relieved.
3. With the impaired viability of the gut wall, comes increased permeability and transperitoneal migration of bacteria and other pernicious agents.
4. In strangulating obstructions in which the infarcted segment is long, the blood loss through hemorrhage into the bowel wall and lumen may be great.

In order to prevent the ill consequences just enumerated, the ideal treatment of intestinal obstruction consists in the early release of the obstructing mechanism. A rational therapy of obstruction consists of the following:

1. Adequate fluid replacement to undo the harmful affects of fluid loss.
2. Replacement of blood loss in strangulating obstructions by transfusion.
3. Relief of the obstruction either by:

(a) Releasing the obstructing agent where possible; or

(b) Procuring reduction in intra-intestinal pressure by decompression.

In strangulating obstructions, release of the constricting agent is imperative. Early liberation of the strangulated gut permits treatment of the obstruction as though it were simple in character. Only in mesenteric thrombosis and embolism are the vessels actually plugged.

In simple obstructions, a choice of therapeutic procedure is available. The remedial measure which commands the least risk is to be selected. If the obstructing agent lies outside the bowel, its removal is indicated in all early obstructions; in late obstructions, it is often more prudent and expedient to decompress the distended bowel.

## SURGICAL TREATMENT

All operations in bowel obstruction must be done aseptically. Visible soiling from the obstructed bowel—even though minimal—almost invariably results in peritonitis. Extensive handling of the obstructed bowel is not well tolerated and is to be studiously avoided. The immediate restoration of bowel continuity—save in very high obstructions—is a matter of secondary concern. Anastomotic procedures, in the presence of acute bowel obstruction, are notoriously unsafe because of the danger of contamination. Drainage by an aseptic enterostomy, in late simple obstructions of the small intestine, is the operation of choice. In simple obstruction of the colon, caused by an intrinsic lesion in the bowel wall (carcinoma), an aseptic colostomy is the only procedure which relieves the obstruction, and the procedure can be done with minimal risk. Many patients with late simple obstruction can be salvaged by judiciously chosen operative procedures carefully executed. The secret of a successful operation in such instances is the type of operation which will relieve the intra-intestinal pressure and preserve the sterility of the peritoneum with the least amount of handling.

Experience with the employment of enterostomy in the relief of simple obstruction has shown that the continuity of the intestinal canal is frequently re-established automatically after drainage of the segment of bowel proximal to the obstruction. Sometimes it is atsonishing how quickly this may occur following the external escape of only moderate quantities of gas and fluid. Wangensteen states that a scout film of the abdomen made soon after completion of the operation often demonstrated that gas had progressed into the colon. These observations led to the natural conclusion that decompression in some instances of mechanical obstruction of the small bowel could be effected by suction applied to an inlying duodenal tube. Trial has verified the correctness of this impression. The extensive trial which suction has had in many hands in the relief of intestinal distension has served to emphasize the importance of decompression of the bowel in the treatment of intestinal obstruction.

## SUCTION THERAPY

Wangensteen emphasizes the fact that only the physiologic obstructions (paralytic and spastic ileus), and some simple adhesive obstructions can be safely treated by this agency alone. In the majority of bowel obstructions, operations, of necessity, must remain the chief therapeutic resource of relief. Suction is an agent of wide usefulness as an auxiliary aid in most intestinal distensions—of whatever origin. Chronic occlusions of the colon and small intestine can usually be decompressed by suction. After relief of the distension, the accluding agent should be attacked surgically in a non-obstructive phase. In addition, suction is of great

value in preventing intestinal distension when used early after abdominal operation. Swallowed air, the chief source of gaseous distension, and fluids dumped in at the gateway of the intestinal canal are effectually removed by suction.

In treating mechanical obstructions by suction, one must be acquainted with its limitations. Strangulating obstructions and occlusions of the colon, accompanied by considerable distension, are not amenable to relief by suction. They must be subjected to operation as quickly as possible. Further, it is necessary to follow the distension by subsequent X-ray films made at intervals of about twelve hours. Failure to escure diminution of intestinal distension as indicated by the scout film, or progression of gas into the colon are indications for operation.

It is obvious that the employment of suction demands particular attention with reference to the state of hydration. Enough saline solution must be given paraorally to insure a liberal daily urine output (700 to 1,000 c.c. every 24 hours).

## CONCLUSIONS

The successful management of bowel obstruction calls for accurate diagnosis. When the affects of obstruction upon the bowel and organism are universally understood and appreciated, then a definite and general lowering of the mortality and morbidity of this most feared condition will become apparent.

The chief therapeutic problem of bowel obstruction is the relief of obstruction before loss of viability of the gut wall becomes apparent. Many lives will be saved from the wreck of obstruction by the judicious choice of therapeutic procedure.

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## DISCUSSION

*Dr. H. V. Fall, Roswell:*

"By his excellent presentation of the subject Dr. Monaco has demonstrated very clearly the important factors encountered in the diagnosis and treatment of intestinal obstruction.

The dehydration with accompanying toxic condition call for energetic measures at once to reestablish the body fluid balance. Intense pain is also a factor that must be considered. Application of heat to the abdomen or the ice bag locally with judicious use of morphine will add greatly to the comfort of our patients. Any part of the intestine may become obstructed in various ways and it is important to locate the site of the obstruction and to recognize its type as early as possible.

I have not received the same aid from the X-ray as Dr. Monaco mentions, and have had to make my diagnosis largely without its aid. Ileus will often confuse the surgeon for a short time especially when associated with sudden pain from gall stones or renal calculus.

Different types of obstruction require different surgical care, but all types require fluids and other measures to minimize the shock that invariably accompany these cases.

I have read this paper with considerable interest and feel the diagnosis, symptoms and treatment have been presented so completely that very little need be added."

*Dr. Monaco, (closing):*

"Thank you, Dr. Fall, for your discussion. It was my expectation that someone would say a few words on the classification of bowel obstruction; the mortality from operation; how to deal with a strangulated gut, and the choice of surgical procedure.

When you have a case of bowel obstruction action is required. The patient is alarmed and so is the physician as well as the family. The surgeon must keep cool and not become too radical. There are times when one can wait before resorting to surgery, especially if the case is far advanced and in a state of marked dehydration. The management of bowel obstruction is not standardized but you must use your own judgment in the treatment of each individual case.

The purpose of this paper was not to be ultra scientific, it was just to give you a general idea of the management of these cases. Replacement of lost body fluid is not a difficult procedure. If decompression of the bowel is necessary, you do not have to be a super surgeon to do that. The technique of blood transfusion has been so simplified that the average man ought to be able to perform one. With the replacement of fluid, blood transfusion and decompression of the bowel by the Wangensteen method, the average physician can summon expert help.

The treatment depends on the classification of the obstruction. Clinically obstructions are classified into Mechanical and Neurological. Pathologically they are classified into simple and strangulated. Mechanical obstructions may be simple except when they occur in the colon, then they are strangulated. Treatment of mechanical obstructions is surgical.

In the Neurologcial type of obstruction, which includes paralytic ileus, the treatment would be by suction."

# Subinvolution of the Uterus

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SUBINVOLUTION is a condition following pregnancy in which the uterus, including its blood vessels and component layers, fails to resume normal size, shape, histological structure, consistency and function. In other words, it is an arrest in the process of regeneration anywhere short of the normal state of the resting organ. Let us consider the normal process of involution of the uterus. Beginning with the birth of the child or the expulsion of the fetus or ovum, involution of the uterus enters upon a process of diminution in size and construction which normally is complete only when it has been restored to its original state. The muscle fibers of the uterus during pregnancy increase in all

Delivered before the New Mexico Medical Society at its Fifty-sixth Annual Session, Santa Fe, N.M., June 6-8, 1938.

dimensions about twenty times. The capacity of the uterus increases about four hundred and fifty times. The vessels, both afferent and efferent, the connective tissue and the endometrium show hypertrophy, to a degree for which we know no parallel.

### PROCESS OF INVOLUTION

When the process of involution begins, the uterus contracts from all sides by the energy of its own fibers, thoroughly compressing all vessels which permeate the "basket weave" of the middle layers of the organ. The uterus a few hours after delivery has a pale pinkish color due to ischemia—which proves the remarkable power of contraction of the muscle fibers. While in this condition, autolytic ferments begin their work upon the protoplasm of the muscle fibers and of the stroma, causing great quantities of complex protein to be changed to simpler structures which are disposed of by the circulation. The arteries and veins have become collapsed and thrombosed, and, according to the views of the latest students of this process, are hyalinized and completely absorbed, while new vessels from the external layers of the uterus permeate the muscle fibers and gradually replace, and assume the work of, the old set. Gristlelike cords, which are the remnants of the old blood vessels, may be seen many months after pregnancy.

The endometrium undergoes a remarkable change. During pregnancy this lining, together with the layers of the ovum, make up the decidua which covers the entire inside of the uterus, except the placental site. Penetrating deeply into the muscle of the uterus are projections commonly called glands; so far as it is known they secrete nothing but are simply cell rests or island grafts from which a new endometrium generates by the tenth day. During the first ten days of the puerperium the placental site protrudes into the uterine cavity and becomes exfolitated like the outside layers of back of forest trees, taking with it all that great mass of useless blood vessel debris which made up the site of the placenta. This is an indispensable function. If it were not for the complete exfoliation of the placental site, three or four pregnancies would so fill the uterus with scar tissue that further pregnancies would be impossible, and the menstrual function would resolve itself into one continuous hemorrhage.

### SUBINVOLUTION

We have now reached the consideration of subinvolution, which is the result of the arrest of the process of involution and may occur at any point short of completion. Among the more common causes are birth injuries, especially cervical tears, perineal tears, or relaxations which permit the pelvic viscera to descend to an unnatural level. Chronic suppurations and fibroids frequently cause this complication. Toxemia, anemia, repeated pregnancies, diseases causing disability—such as long standing infections, pneumonia, and typhoid fever, malnutrition and endocrine disturbances—may cause or aggravate this condition.

The pathology of this condition depends upon the stage of involution attained before the process was arrested. The blood vessels are imperfectly thrombosed. Hyalinization of the vessels is partly complete and the absorption of the unnecessary portions unfinished. The muscle fibers show fatty degeneration, incomplete absorption, sometimes cloudy swelling and give the impression of an unhealthy, water-logged mass. The normal ratio of muscle to stroma of 60-40 appears distrubed or may even be reversed. The mucosa of the uterus may be necrotic. The placental site does not properly exfoliate and masses of collagen may still adhere to it. The uterus itself is generally in the retroverted and retroflexed attitude resulting in twisting of its major vessels, prolapse of the ovaries, partial blockage of its lymphatic return, so that normal circulation of tissue fluids is greatly hampered. There is a foul, grayish, frequently blood-streaked and sometimes hemorrhagic uterine discharge which is the result of chronic inflammation of the various layers of the uterus—in other words, metritis.

The diagnosis of this condition is not difficult. The patient says she has not properly recovered from her pregnancy, has pain in the back, loins, lower abdomen, or in the sacral region; walking and sitting are uncomfortable and may be intolerable because of "that awful dragging-down feeling" due to heavy and painful pelvic organs. Irritating discharges may have caused local ulcers which add to the general and local discomfort of the patient. She is and looks anemic, has no appetite, and is scarcely able to "drag herself around." Thus we have a picture of a very miserable and unhappy human being. Fortunately if discovered in time and promptly and energetically treated this condition is one of the most tractable of any of the troubles of women.

The prognosis of this condition is good if proper treatment is applied. However, if the condition is neglected or if the doctor says "You will be all right in a month or six weeks" or, "After all, it takes half a year to get over having a baby," the resulting delay may cause permanent and irreparable injury to the sufferer. The condition discussed under the pathology of the reversal of the ratio of muscle to fibrous tissue can easily result in permanent structural changes.

### TREATMENT

The medical treatment in subinvolution depends enitrely upon its cause. If the patientt presents only the anemic type, or if there is some systemic disease, the treatment is solely medical—provided all local conditions are normal. Rest in bed upon a hard mattress, supported so that it does not sag, is of great help. Sleeping face down may be of benefit, and knee-chest exercises are valuable. The Sitz bath with the water maintained at a temperature of 106 to 110 degrees is beneficial. Various gyneologic manipulations may be of value. Bearing in mind that the uterus is waterlogged, a certain amount of bimanual massage, if the patient is not too fleshy, can be of great benefit. The vaginal

hand presses the fundus to the abdominal wall and, by gently stroking from the top in all directions with the abdominal hand, a certain amount of massage can be transmitted to the uterus. If this is faithfully done three or four times a week for a fortnight, a marked improvement will be noticed. The Elliott treatment, entailing the use of a properly shaped waterbag placed in the vagina and maintaining an elevated temperature is of value in these conditions. If the patient seems sluggish, one-half grain of thyroid extract, t.i.d. may be helpful. The most important therapeutic considerations, however, are those of an hygienic nature. No woman can properly recover from a pregnancy if there is insufficient sunshine, fresh air, good food, or proper rest available to her. If the household is not tranquil, if there is an officious grandmother, or if the baby is colicy and disturbs her rest frequently at night—all these conditions must be remedied or the doctor's work will be largely nullified. I use a capsule containing three or four grains of powdered extract of ergot U.S.P.; quinine, two grains; and a sixtieth of strychnine. This can be given twice daliy over a period of weeks and brings about favorable effect. The newer ergot derivatives may be more potent and convenient. If the uterus is retroverted, the judicious use of a hard rubber pessary is helpful. A word about pessaries: The hard rubber doughnut of the Hodge pessaries are best suited to this purpose. If a doughnut pessary is properly fitted it is of great help in keeping the uterus at the normal level so that the necessary circulation is maintained. Most women tolerate soft rubber pessaries badly, because there is the same friction between soft rubber and the vaginal wall that there is between an eraser and writing paper—and this constant friction soon results in vaginal ulcers. Hard rubber material, on the other hand, does not become macerated, slides smoothly, and does not cause discomfort. In the presence of profuse discharge, these pessaries should be occasionally cleansed. Removal is not necessary, as all that is needed is thorough treatment of the vaginal mucosa with alum solution or one-half per cent silver nitrate solution. Women should be instructed to manipulate the douche point in such a manner that the crevices around the pessary are thoroughly irrigated.

## SURGICAL ASPECTS

There is much difference of opinion on some phases of the surgical treatment of subinvolution, but all are agreed that cervical and perineal lacerations and relaxations must be repaired. If a foul discharge exudes from the cervix, there may be remnants or undislodged pieces of placenta or of placental site in the uterus. If the patient is free from fever, curettage may be undertaken. My method for dealing with these conditions is as follows: I use the conical cervical dilator, first grasping the lower lip of the cervix with a vulsellum forcep. I prefer to grasp the lower lip, because traction there tends to straighten out the cervical canal. Beginning with the 11 or 12 dilator I gradually work up to about a 26, which is large enough for any curetting operation. Using the conical dilators, inserting and pressing them in slowly, results in an equal dilation of the cervix in all directions. The process is essentially that of fatiguing the circular muscle fibers of the cervix so that they relax. The stretching process is kept up in a slow and leisurely manner. A good test of the proper rate of stretching the cervix is obtained by watching the tenaculum. If the pressure is moderate and no particular sign of strain is noted at the point where the tenaculum grasps the cervix, the rate is adequate. Ten minutes of actual dilating time should be the minimum. Surgical anesthesia is necessary, as otherwise the cervix will instantly spring back as the dilator is removed. In that way the cervix is not torn—which, by the way, occurs very easily because of the edema present in the subinvoluted uterus. Usually the amount of material found will be surprisingly small. A little necrotic debris is usually all that is found, but it is the cause of the trouble. Do not under any circumstances scrape the uterus vigorously. In certain conditions curettage with a sharp curet, until eliciting the familiar grating sound, is indciated—but that is not the case in subinvolution. What we are trying to do is simply to eliminate undesirable "leftovers" from the pregnancy, and it is indeed seldom that a very moderate amount of scraping will not do. If the cervix is alreday wide open, the gauze-covered finger is much superior to the curet. With it the surgeon may easily explore the inside of the uterus, bringing it within reach by the other hand on the abdomen in such a way that all sides and fundus of the uterus may in turn be presented to the examining finger. Let me emphasize that the amount of material obtained in curettage for this purpose is entirely out of proportion to the damage it may do. After curetting it is not necessary to wash out or irrigate the uterus in most instances. If the surgeon wishes to do so, the best solution is hypertonic, three or four per cent, salt solution, maintaining the temperature at about 110 degrees and using a large rubber catheter. The hypertonic salt solution prevents absorption of the water-soluble elements of the debris in the uterus and prevents subsequent febrile reaction and chill of the patient. Packing of the uterus under these circumstances is a procedure that is surgically unsound. Why try to obtain drainage and then impede it by packing? The uterus tends to contract, especially after the irrigation. However, if the surgeon deems it necessary to pack, a three-inch roller bandage that has been properly sterilized by boiling or in the autoclave may be used. It forms a firm, snug-fitting pack and can be easily and painlessly removed at the proper time by pulling out with the forceps.

## CERVICAL LACERATIONS

A few words on cervical tears may not be amiss: The cross section of the cervix shows three main strata. The interior of the cervix with its submucosa, containing glands and the arbor vitae, may be seen in cross section. More deeply we note the muscular layer, which is much the thicker and consists of circular fibers interspersed with longitudi-

nal fibers which originate in the fundus. Joining the vaginal mucous membrane is the endocervix above described. What appears to be an angry red cervix in a laceration is actually the columnar epithelium of the cervix exposed to the rough vaginal mucosa. When a cervix tears, the muscular fibers pile up on either side of the tear, resulting in thick anterior and posterior lips which in no way resembles the normal cervix. The problem then in repairing the cervix is to restore the structure and balance the tension of the cervical sphincter and cover it properly with mucous membrane. The edges of the tear are denuded and all scar tissue carefully dissected out. Bleeders should be tied with fine catgut. Using a short Emmett needle, beginning at the apex of the tear, place a suture beginning in the cervical canal, proceeding almost to the circular layer, spacing over the gap and going out again into the cervical canal. This is tied and the suture is continued until the real lip of the cervix is reached. This suture has all knots in the cervical canal. If the tear is bilateral this step should be performed on each side before proceeding with the next step. Then reaching well up into the apex of the tear, a second row of sutures is placed, entirely buried; thus the continuity of the sphincter is restored. When this has been completed on both sides, the vaginal mucous membrane is sewed over this, constituting a third layer. If the tear goes high in the fornix it may be well to place the highest stitches well away from the cervix, because there will be some lateral tearing of the fornix. Then proceeding downward, place overcasting and locking stitches until the external os is reached. Repairing a cervix in this manner results, in the majority of instances, in healing by first intention. If the next labor is slow, these are not likely to tear out again, because the scar tissue is probably the strongest part of the entire cervix. Recalling the above suggested points it follows that cauterization is not the remedy for deep cervical lacerations. It is, however, an excellent means of repairing small lacerations which are not over one-half inch deep. A cervix that has been repaired or one that has been recently dilated should receive some after treatment by passing a sound such as an F. 16 or 18 periodically for several months. Strictures may result if this simple precaution is not observed. The repair of the perineum may safely be undertaken when the discharge is not too foul or when only a small amount of material has been removed by curetting, as suggested above.

## POST-ABORTION SUBINVOLUTION

So far we have considered only subinvolution following term delivery. The same conditions obtain following abortion or miscarriage. Fetal remnants remaining in the uterus for any length of time causes temporary damage to the organ and sometimes results in permanent fibrotic changes which may indicate hysterectomy for the resulting hemorrhagia. In the manner suggested above the curet can easily be inserted and with it the remnants removed. But, remember, under no circumstances stretch the cervix or disturb the mucosa of an infected uterus. The difference between removing fetal remnants and of scraping or ploughing up the mucosa is as great as the contrast between night and day. One is beneficial and the other is deadly.

Cases of subinvolution due to pelvic pathology such as pelvic abscess, pelvic phlebitis, fibroids, form a separate category and need not be considered here, since that is secondary to a surgical condition apart from this discussion. It must always be borne in mind that not all cases of subinvolution lend themselves to one form of treatment. We practice a profession and individualize our cases and problems. What counts most of all is the ingenuity, the skill, and common sense of the physician. With an accurate knowledge of the pathology and of the causes of subinvoluiton, the efficient treatment will be devised and judiciously applied by the doctor.

1612 Tremont.

## DISCUSSION

*Dr. C. B. Elliott (Raton):*

"I am sure that I voice the sentiment of all the people here when I say we are deeply indebted to Dr. Heusinkveld for this interesting, instructive and illuminating paper. I might go so far as to congratulate him on his paper but will refrain for I recall a story told about the late Dr. John Deaver who had performed an operation in his usual brilliant style, and as he stepped to the side of the operating arena, a doctor in the gallery came down and said 'I want to congratulate you on the very brilliant manner in which you performed the operation.' Dr. Deaver looked at him and said, 'How in hell did you expect me to do it?' So, I do not know whether to congratulate Dr. Heusinkveld or not.

This subject of subinvolution is of great interest to us. With the possibility of a few exceptions, there is no doctor who has not done or at the present time is not doing some obstetrics. I think we are all familiar with the picture of the occasional patient who has not done well following delivery. She complains of being tired, is anemic, has no appetite, with a dragging down feeling in her pelvis. Vaginal examination reveals a very much relaxed pelvic floor, the round ligaments have not returned to normal size and there is a markedly displaced uterus. This is a problem we all have to meet. The reason, I believe, we have a great many of these cases is that they are not carefully examined after delivery. We do not know why this woman does not return to her usual good health, and we say 'Oh, it takes six months to get over having a baby,' and lose sight of the fact that there may be something radically wrong there. Moreover, I am free to confess I have become somewhat discouraged in the attempt at prevention of these cases. Have we seen that the nurses exerted all possible care? We try to put this patient in the very best possible condition, yet when we have finished we find out that in spite of our careful attention to the proper positions, etc., and not lying on the back too much the first few days, and advising certain exercises at stated intervals, she returns with a badly relaxed perineum and the uterus is displaced, so no wonder one feels discouraged. I wonder what Dr. Heusinkveld's reaction is to that? The late Dr. Williams of Johns Hopkins, a few years ago published articles particularly in regard to subinvolution. In these articles he mentioned a great many cases where for some reason or other the uterus had been removed shortly following delivery; in a

very large number of these cases, examination of the uterus was made only a few hours after delivery. From the results of these examinations he formed several conclusions. He felt that the cervical mucosa returned to its normal state about a week after delivery. The placental site was completely obliterated in from six to seven weeks. He also thought the infiltration about the placenta site was not a result of an inflammatory process or external necrosis, but was entirely a proliferation of the endometrial tissue.

We are all familiar with the experience that several days after delivery or even longer than that, you are called in consultation or have a patient of your own in which a portion of the placental tissue was passed and the family was of the opinion the doctor was at fault. If you made a careful examination of the placenta at time of delivery, and if you can detect no missing placental tissue, the amount left in the uterus will be practically negligible.

I am very happy to have heard Dr. Heusinkveld's paper and very grateful for the opportunity of discussing it."

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*Dr. S. L. Burton (Albuquerque):* Cases of lacerated peritoneum are medical cases and not surgical, though once in a while they must be curetted. They should be treated medically before being treated surgically. Surgical treatment is not necessary, so why should there be a hospital fee and other costs inflicted upon this type of case?

*Dr. H A. Miller (Clovis):* I would like to take this occasion to thank Dr. Heusinkveld for his presentation of this subject. I am not going to attempt to criticize it at all. There is one question I would like to ask, and that is in regard to packing. Would not a light pack stimulate a septic uterus?

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*Dr. Heusinkveld:*

I believe that if any normal, healthy human being were put to bed and waited on, without any exercise or, in other words, treated like the average obstetric patient, he would be almost as soft from sheer lack of activity as is an obstetric patient at the end of that time. In other words, the sheer inactivity is a large factor in causing the usual postpartum weakness and debility. For that reason I encourage my patients to considerable activity in bed during the postpartum period. I generally get them out of bed on the seventh day, having them lifted to a wheel chair and taken out into the corridors or solarium. This gives a great amount of mental stimulation and helps much to recover physical strength. Packing the uterus for stimulation may be done, but it has one factor of danger, which is the possible damming up of drainage which must be gotten rid of. This can more readily be done with ergot, quinine, and strychnine in moderate and long continued doses.

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# Ectopic Pregnancy

LEE MONROE MILES, M. D.
*(A study of sixty-three cases from St. Joseph Hospital)*
*Albuquerque, New Mexico*

During the period from January 1, 1930 to May 1, 1938, sixty-three patients were operated upon in St. Joseph Hospital for ruptured ectopic pregnancy. Of these, twenty-six were of Spanish-Indian (Mexican) blood, thirty-five were Anglo-Europeans, and two were American Negroes. These sixty-three cases of ectopic pregnancy occurred in 1,907 cases of abdominal operations on women during the same period. Thus, 3.3% of all abdominal operations on women were performed for this condition. Of the total sixty-three operations only one patient died, making the mortality 1.58%. Incidence of ectopic pregnancy in this series is 7.8 cases per year.

TABLE I.

| Race | |
|---|---|
| Spanish-Indian | 26 |
| Anglo-European | 35 |
| Negro | 2 |

| Previous Pregnancies | | | |
|---|---|---|---|
| Pregnancies | Patients | Pregnancies | Patients |
| 0 | 23 | 3 | 3 |
| 1 | 15 | 4 | 2 |
| 2 | 10 | 5 | 3 |
| | | 6 | 2 |

Ages, 18 years to 42 years.
Pregnancies after operation for ectopic pregnancy, 3; of these, 2 were tubal.

| | |
|---|---|
| Total abdominal operations in women | 1,907 |
| Incidence of ruptured ectopic | 33% |

Two recent studies of ectopic pregnancy have been presented from hospitals in large urban centers. The first by R. M. Grier[1], at the Evanston Hospital, present 100 cases over a period of 14 years, an average of 7 per year. His mortality rate was exactly 3%. The second report by P. Graffagnino, L. Seyler, M. M. Bannermann[2], New Orleans, presents 490 cases of ectopic pregnancy over a period of 18 years, an average of 27 cases per year, with a mortality rate of 12.8%.

The present study was undertaken with the purpose of presenting a series of cases, comparable in number, with previously reported series, and to furnish a comparison between similar cases reported from larger institutions and cases from a hospital in a smaller community with a large and sparsely settled country territory from which many of our cases were drawn. In our series, 22 patients resided in Albuquerque, and 41 patients came from outside the city, many of them from towns and rural districts over 100 miles from the hospital. Earlier case records in our series are incomplete in many details, later records are more nearly complete. Nevertheless, much interesting and important information can be obtained from this series reported.

As would be expected, the age range of the patients falls within the child-bearing period. The youngest patients (2) were 18 years of age, and the oldest patient was 42 years of age.

Three pregnancies occurred after operation for ectopic pregnancy. One patient whose first pregnancy resulted in an ectopic pregnancy, for which she was operated upon, had a second pregnancy

Delivered before the New Mexico Medical Society at its Fifty-sixth Annual Session, Santa Fe, N.M., June 6-8, 1938.

resulting in a normal term delivery, and at her third pregnancy the fetus developed in her only remaining tube which ruptured, necessitating operation and removal of her remaining tube.

The second patient who conceived following operation for ectopic pregnancy did so in less than six months—the pregnancy was in the remaining tube, which ruptured and required a second operation.

Other pregnancies following operation for ectopic pregnancies may, and likely did, occur, but the patients were not delivered at St. Joseph Hospital, and so cannot appear in this study.

## ETIOLOGY

Three principal conditions are usually ascribed as the cause of implantation of the fertilized ovum in the tube, viz.

1. Previous inflammation in the tube resulting in partial occlusion, sacculation, or impairment in ciliary activity;
2. Congenital diverticula of the tubes;
3. Misplaced endometrial tissue in the tubes. Frankel & Schenck[3].

To these have been added as possible occasional causes, fibroids of the uterus causing pressure occlusion of the tube; ovarian tumors causing pressure or kinks of the tubes; appendicitis with peritonitis causing kinks or compression of the tubes, and many possible causes.

In our series, judged by the opinion of the surgeon performing the operation, previous salpingitis existed in 13 cases, because at operation pathological evidence of salpingitis in the tube, not the site of the pregnancy, necessitated the removal of both tubes, Fibroid tumor of the uterus co-existed with the ectopic pregnancy in one case and may have been the connective factor.

## DIAGNOSIS

Actual bedside diagnosis of ectopic pregnancy is far more difficult than one would be led to believe from the text book diagnosis. In this series correct preoperative diagnosis was made in 19 cases, or 30%. Of course, this report does not indicate the numerous times ectopic pregnancy was made as the preoperative diagnosis and operation revealed no pregnancy in the tubes.

The classical description of a ruptured tubal pregnancy is:

1. History of 1 or more missed menstrual periods;
2. Sudden, severe, sharp pain in the lower abdomen;
3. Pain is followed by vaginal bleeding which is not, as a rule, very profuse;
4. Shock, fainting collapse.
5. Uterus enlarged corresponding nearly with number of periods missed, cervix soft;
6. Mass in pelvis which is either in the cul de sac or to one side of the mid-line, and is very painful when palpated;
7. Pain caused by pressure over lower abdomen, and especially by any movement of the cervix.

These signs are so rarely present and the sequence of events so rarely follows this simple routine, that when I do encounter them, I am inclined to make another diagnosis. In our series, in which records gave the data, 14 patients had missed no menstrual periods nor had any irregularity of the periods, 20 had missed one period, and 8 had missed two periods. In 35 cases the pain was quite characteristic of the classical picture—in the others, pain, though present, was not of the type usually described. 21 had characteristic vaginal bleeding, but 5 had no vaginal bleeding.

TABLE II.

53 cases giving accurate description of symptoms of rupture before operation:

| | | | |
|---|---|---|---|
| Same day | 8 | 10 days | 3 |
| 2 days | 6 | 14 " | 3 |
| 3 " | 4 | 15 " | 5 |
| 4 " | 2 | 17 " | 3 |
| 5 " | 2 | 28 " | 7 |
| 7 " | 3 | 42 " | 4 |
| 9 " | 1 | 60 " | 2 |

Ectopic pregnancy is so frequently described as a very critical occurrence that its chronicity is not often recognized. Table II shows this very well. Of the 63 patients, 53 gave very definite history indicating the time that elapsed between first symptoms of rupture and treatment. Of these 53 patients, only 8 were operated upon on the day the primary rupture occurred, and of these, 1 patient died. All of the other patients who had what might be termed "chronic ruptured ectopic pregnancy" recovered. History in many of these cases shows not one rupture, i.e., internal hemorrhage, but several distinct attacks of pain. Many of these patients were up and doing their work between "ruptures" and only came to the hospital when they were unable to continue their daily routine.

Laboratory tests may give some aid in making the diagnosis, but no laboratory test gives absolute proof of correct diagnosis. In this series white blood cells were above 10,000 in 23 instances, the highest count being 25,800; and the count was below 10,000 in 16 instances, the lowest count being 6,200. Red blood corpuscle count was recorded in 23 instances, the lowest count being 1,800,000, and in 3 instances the count was over 4,000,000, and in 8 instances between 3,000,000 and 4,000,000. Hemoglobin determination ranged from 20% to 88%. The Friedman pregnancy test has proven to be unreliable as an aid in diagnosing ectopic pregnancy.

Other aids in diagnosis in this series were cul de sac puncture in one case; curettage in four cases with decidua found in two; and two cases in which a perfect decidual cast of the utuerus was passed.

X-ray following injection of opaque oil may in a few rare instances aid in making a correct diagnosis. Mathien[4] has reported several cases with characteristic findings.

## TREATMENT

There is no safe and satisfactory treatment for ectopic pregnancy except surgical intervention. The only question is the safe and favorable time for operation. In our series 18 patients were operated upon as emergencies on the same day the patient was admitted to the hospital. One patient who was operated upon within five hours of the initial rupture died. 36 patients were operated upon within twenty-four hours after admission to the hospital; 4 patients were operated on after a stay in the hospital of over forty-eight hours.

The one and only criterion by which to judge the safe time for operation is the condition of the patient. A patient in evident shock from internal hemorrhage is in no condition to stand a major abdominal operation. I think it can safely be stated as an axiom that no woman ever dies as a result of her first internal hemorrhage unless she is operated upon at an unsuitable time. Fortunate is the patient who lives far from the ambitious surgeon and goes to bed and remains there until her circulatory equilibrium has been restored.

Even a second hemorrhage rarely proves fatal—Nature is again able to compensate for loss of blood. Our cue in selection of time of operation is to imitate Nature and wait for this time of compensation. We are able to assist Nature in this regard. Supply of fluids orally, subcutaneously or intravenously restores circulatory volume and combats shock. Saline solution, glucose and saline, gum acacia solution, are all suitable for administration while the patient is being grouped and matched for the best of all fluids, whole blood by transfusion. Not all patients need transfusion, but for those who do, it is a life-saving measure. In our series only 5 patients were given the benefit of whole blood transfusion. Auto-transfusion was used twice with satisfactory results. Morphine is of inestimable value. It relieves pain, quiets the nerves, reduces metabolism and slows the heart rate. Stimulants designed to raise blood pressure or quicken the heart rate do more harm than good. Gradual restoration from shock is not liable to cause renewed hemorrhage.

When the blood pressure is restored to a safe level, when the pulse is regular and its rate slowed, is the correct time for operation.

Operative treatment in our series is shown in Table III.

TABLE III.

| Operative Procedures | |
|---|---|
| 1 tube removed | 37 |
| 1 tube and ovary removed | 13 |
| 2 tubes removed | 9 |
| 2 tubes and 1 ovary removed | 4 |
| Appendectomy | 8 |
| Hysterectomy | 1 |
| D. & C. | 4 |
| Cul de sac puncture | 1 |

Table IV shows morbidity as affected by drainage. Unless complicated by some other condition which requires drainage, ectopic pregnancy, per se, not only requires no drainage, but drainage is very definitely contra-indicated. It decidedly prolongs convalescence and adds to the patient's risk.

TABLE IV.

| Postoperative Course as Influenced by Drainage | | | | | | |
|---|---|---|---|---|---|---|
| Patients drained | | | | | | 22 |
| Patients closed without drainage | | | | | | 41 |
| Patients well and dismissed on: | | | | | | |
| 9th day: | drained | | 1; | without | drainage | 5 |
| 10th " | " | | 0; | " | " | 6 |
| 11th " | " | | 3; | " | " | 15 |
| 12th " | " | | 3; | " | " | 7 |
| 13th " | " | | 7; | " | " | 3 |
| 14th " | " | | 2; | " | " | 0 |
| 15th " | " | | 0; | " | " | 1 |
| 16th " | " | | 4; | " | " | 2 |
| 20th " | " | | 0; | " | " | 1 |
| 28th " | " | | 1 | | | |
| 47th " | " | | 1 | | | |

The advisability of appendectomy as an added procedure in operations for ectopic pregnancy is questionable. Some surgeons now are advocating the removal of the appendix, and in our series it was done in 8 instances. Personally, I have always thought it might add to the danger of the operation, and I have never removed the appendix in the presence of an ectopic pregnancy.

The one fatal case is summarized herewith:

Spanish-Indian woman, 23 years of age. She missed two menstrual periods. At 9 a.m. she experienced severe pain in the lower abdomen, was immediately prostrated and had a little vaginal bleeding. She was seen promptly after symptoms and taken to the hospital. At 1:40 p.m. she was operated upon. Saline solution was started intravenously as operation was begun. She died in shock at 6 p.m. Laboratory work was done as follows: Hemoglobin 55%; red corpuscle count 3,050,500; white cell count 13,550; she was Moss type IV. No transfusion was done.

## SUMMARY

1. Sixty-three cases of ectopic pregnancy are presented. These were found among 1,907 cases of women requiring abdominal surgery—an incidence of 3.3%.

2. Only one fatal case of ectopic pregnancy occurred in these 63 women—a mortality rate of 1.58%.

3. It is especially called to your attention that only 8 patients were operated upon on the day the primary hemorrhage occurred.

4. Judging from our results, we feel safe in saying that ectopic pregnancy should be taken off our so-called "emergency" classification, and that the patient be given time and the necessary medical assistance to become stabilized before operation is performed.

Cases of ectopic pregnancy herewith presented from the St. Joseph Hospital are from the services of the following: Doctors P. G. Cornish, L. F. Elliott, J. W. Hannett, J. D. Lamon, Jr., W. R. Lovelace, W. H. Woolston, and L. M. Miles. My thanks are hereby expressed to these doctors for permission to review their case histories for this presentation of the subject.

221 W. Central Ave.

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## DISCUSSION

*Dr. G. Heusinkveld, Denver, Colo.:*

I enjoyed Dr. Miles' paper on "Ectopic Pregnancy" very much. It is interesting to know that the gravity of the symptoms of ectopic pregnancy depend largely on the location of the rupture. If the site is near the uterus where the blood vessels are large, the symptoms will be grave, with extensive hemorrhage, as a vessel of considerable size is involved. Rupture near the end of the tube may be so insidious that it is frequently overlooked. I am glad to hear Dr. Miles say that he does not do an appendectomy at this time. I belive that no other surgery should be attempted when the abdomen is

already filled with blood and the peritoneum consequently greatly irritated. Some time ago we heard much about Cullen's sign, which is a bluishness around the navel and supposed to be diagnostic of a tubal pregnancy. I have never seen it and have not found another surgeon who has. While it may be there and I am not acute enough to detect it, I do believe that it is not of any great value. There is, however, a symptom which sometimes is almost diagnostic, namely, urgency to stool; blood in the cul de sac irritates the rectum and gives this feeling of great distress. The characteristic pain of tubal pregnancy is a lancinating, disabling, sudden agony with a tendency to make the patient faint. This is soon followed by the symptoms of shock and hemorrhage.

*Dr. Miles:*

"Dr. Heusinkveld did not take issue with me half as much as I expected he would do. I fully agree with him that occasionally we find a case of ectopic pregnancy which is in urgent need of prompt surgery. However, I am fully convinced from our expeirence here that these cases should not be operated upon until the blood pressure and pulse have become stabilized. If a little time is spent in aiding the patient to a better physical condition, we will not have the danger of an emergency operation on a person who is already dangerously ill."

# Fractures of the Forearm and Lower Leg

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and
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*Rochester, Minn.*

In the management of a large number of cases at a City-County Hospital it is useful to check up periodically on results obtained in order to compare them with results obtained elsewhere. It is also useful to compare results in one type of fracture with those of another. A detailed and careful review was made of the fractures of the forearm and lower leg, which were admitted to the El Paso City-County Hospital in a period of 12 months. Fractures of the adjoining joints of both regions were also included. The results seemed rather interesting and they are being reported so that the volume and type of cases and the end results secured may be generally known.

Inasmuch as the El Paso City-County Hospital is entirely a charity institution it is obvious that no compensable industrial accidents would occur in the series reported. On the other hand a larger number of arm fractures in children would be expected to be found in this series and this was found to be so. A high percentage of injuries was found to be due to automobile accidents, especially the fratcures of the shafts of the tibia and fibula. The vast majority of the patients were Mexicans as would be anticipated in a city in which over half the inhabitants are of this race. This did not appear to have any bearing on the incidence or type of fracture found.

In grading the results it will be noted that they were graded as good, fair, and poor. The functional result was what was considered primarily in the grading. If the patient could use his extremity well, return to work, and experienced no appreciable amount of pain the result was considered good. No case with any apparent deformity was classified as good. The shortest period of follow-up was 8 months and the longest one year and 8 months.

In addition to making a report as shown on the accompanying charts we have thought it worthwhile to discuss the results, point out some of the more common complications, and describe some of the newer forms of treatment. The subject will be treated by regions.

Orthopedic Service, El Paso City-County Hospital.

## FRACTURES OF ELBOW

There were 6 fractures involving the elbow joint encountered during the year and of these 4 were above or into the condyles, or of the epicondyles. Fractures of the medial and lateral epicondyles are relatively common in children. They are sometimes very difficult to reduce because the epicondylar fragment turns over downward and outward and becomes widely displaced[9]. In these cases an open reduction may be necessary for it is very important to reduce the fragment. It should be fastened in place by suturing through drill holes or by means of a wire nail[10]. The former method is preferable for it obviates the necessity of removing the nail later.

Supracondylar fracturues are usually fairly easily reduced but in order to hold them it is usually necessary to put them up in fairly acute flexion and this is one of the factors which may lead to the production of Polkman's Ischaemia which is a very serious complication of fractures about the elbow[11]. The causative mechanism of this condition is hemorrhage into the closed antecubital space with compression of the blood vessels and nerves and impairment of the circulation. In any fracture about the elbow the circulation and pulse should be carefully watched, particularly for the first 24 hours. In supracondylar fractures put up in acute flexion, the pulse and circulation should be checked every ½ hour. When an impending Volkman's Ischaemia is present the fracture should be disregarded and its treatment discontinued. The extremity should be suspended in light overhead traction, and warm packs applied. If after several hours of this the hand still remains pulseless and blue, operative interference is indicated and an incision made into the antecubital space to relieve the congestion in this area. When a Volkman's ischaemic paralysis with subsequent contracture has occurred recon-

structive surgery offers a chance for some improvement, but not a great deal.

## FRACTURES OF FOREARM

Fractures of the shafts of both bones of the forearm constituted almost half the fractures of the forearm and neighboring joints in this series. This is due to the fact that most of the patients with arm fractures were children rather than adults. Colles' fracture, which is one of the most common fractures in the body, had the astounding low incidence of 2 out of 35 fractures of the forearm. Fractures of the shafts of both bones on the forearm are difficult to reduce it must be admitted and often 2 or even 3 attempts were necessary to effect reduction. However, in none of the 12 cases was anything more than a manipulation and cast necessary and in all cases a good result was obtained. Most of these reductions were done by the interne. These facts do not seem to agree with the teaching of many of the textbooks which stress the difficulty encountered in treating these fractures. Nevertheless open reduction in these fractures is only very rarely resorted to at the El Paso City-County Hospital. Those fractures of both bones of the forearm occurring just above the wrist are often the hardest to reduce and either of 2 maneuvers may be used. In one method strong traction and counter traction is made by 2 assistants and the fragments moulded into place by the operator's fingers. In the other method the fracture site is strongly angulated to a right angle or farther and the fragments worked into engagement after which the arm is straightened. One should be satisfied with less than anotomical replacement in children providing there is plenty of space between the bones to avoid a synostosis or bone block.

In children a separation of the distal radial epiphysis with a displacing of it dorsalward corresponds to a Colles' fracture in an adult[1]. These displacements are usually easily reduced and held. However, as in fractures of one of the epicondyles or any other fracture through a growth center one must be prepared for the possibility of an alteration in the rate of growth, usually a retardation. It is very wise to caution the parents about this possibility. Unfortunately very little can be done about this and if the radius becomes slowed in its growth and the ulna continues to grow normally a radial deviation of the hand occurs accompanied by an undue prominence of the lower end of the ulna. This deformity is best corrected by shortening the ulna when its growth is complete or nearly so.

Little comment will be made on Colles' fracture except to say that it is frequently the cause of prolonged or permanent disability unless radia lshortening is avoided and the angles of the joint surfaces restored to normal[2].

The end results of the arm fractures in general were very satisfactory for 32 out of 35 fractures had a good end result (chart I).

## FRACTURES OF KNEE

Fractures involving the knee joint proper tend to produce residual disability. They involve a weight bearing joint and a traumatic arthritis frequently ensues. In addition to this there is often a tear of one or more of the major ligaments and these almost always lead to permanent disability if they are not held at least 10 weeks so that they may completely reform. An old torn ligament of the knee may be reconstructed surgically, but this procedure is not uniformly attended with good results.

## FRACTURES OF LOWER LEG

Fractures of the table of the tibia may usually be reduced by lateral compression by means of a Forrester clamp which is really a modified furniture clamp. After the fragment has been replaced it should be held by some type of internal fixation. A large wood screw, a beef bone screw, or a Carrell removable screw may be employed[3]. The authors' favorite method is by means of 2 Kirschner wires inserted at different angles and crossed at the fracture site[10]. They are left protruding through the skin, are then bent over after which a cast is applied over them. They may be very easily removed later when union has taken place.

Fractures of both bones of the lower leg have always presented a problem largely because many of them are difficult to reduce and hold by simple manipulation and cast. By referring to chart III, it will be seen that of 25 fractures, 20 were treated by this method with 19 good results and 1 poor result. Open reduction with wiring or application of a Lane plate or Parham band may be resorted to in some cases. This was done once in this series. Skeletal traction in a Thomas splint will often yield good results and was also used in one case out of the 25 fractures.

A newer method of treating these fractures was introduced a few years ago by Roger Anderson and now carries the name of double fixed traction. In this method a Steinman pin or Kirschner wire is placed through each fragment of the tibia and the pins placed in a machine with 2 vices for holding the pins. These horseshoe-like vices may be adjusted to accurately control both fragments and so get them into position and alignment. This method has been received with great favor by some men and has fallen into disrepute in the hands of others. The reason for its unpopularity is largely because of two things. There is a good deal of danger of an overpull because of the ease of controlling the fragments and an overpull may very easily produce a non-union. The other danger in using this method is the possibility of infection around the pins but the likelihood of this is very remote if the same aseptic precautions are used as would be used in doing an open Orthopaedic procedure. This method was used in two of the 25 cases in this series.

Before leaving fractures of both bones of the lower leg a word should be said about compound fractures in this area. In a fresh compound fracture a careful debridement should be done accompanied by a thorough mechanical cleansing with a large amount of water and numerous fresh gauze sponges.

The wound may then be swabbed out with a not too caustic antiseptic. The fracture should then be reduced and held with internal fixation if necessary. If the contamination is not too gross the wound may be tightly sutured with a drain left in. If this is done immediately after the injury only about one-half the cases will become infected.

Old infected fractures in this area in which infection and drainage persist and union is delayed are a very bad problem. Union often occurs even in the presence of infection but if it does not nothing can be done until the infection has cleared up and there has been no drainage for at least a year. At that time a bone graft or some other type of reconstructive surgery may be considered.

Fractures of the tibia at the junction of the middle and lower thirds is one of the most common sites of non-union in the body, the neck of the femur being first[12]. Delayed union is quite common in the shaft of the tibia and these fractures must be kept fixed in a cast until union is visible in the x-ray. A period of as long as 18 months is sometimes required for union to occur.

## FRACTURES OF ANKLE

Of the fractures about the ankle, the trimalleor type probably gives the most trouble. There were four of these out of the eight ankle fractures in the series and of these four only one had a good result. In the other three the end results were only fair. Trimalleolar fractures are those in which both the fibular (lateral and tibial medial) malleoli are fractured and in addition the posterior lip of the lower end of the tibia is knocked off (the so-called posterior malleolus)[11]. When this posterior piece is displaced to any great extent it is very difficult to reduce and this is usually the cause of the permanent disability which often results in these cases. The displacement can frequently be reduced by simple manipulation in which the foot is brought up into dorsi-flexion. If this is not possible a Kirschner wire through the tibia may be employed with a cast over it and the heel and sole of the foot, but not including the foot proper. Another wire is placed through the astragalus and with the patient in bed a constant upward (anterior) traction with a weight and pulley is made. An open reduction may be elected and is often necessary in this fracture if the displacement is very marked.

In ankle fractures the two most important things are restoration of weight bearing alignment and returning the mortise of the ankle to normal. Fractures of the weight bearing lower end of the tibia often give permanent disability with the formation of a good deal of traumatic arthritis. If the persistent pain and disability are severe enough a fusion of the ankle joint may be necessary. This may even be done when the patient is first seen if the fracture is bad enough[17].

The results in the arm and leg fractures in general have been satisfactory as may be seen by referring to chart II. Most of those in which the results were not good have been very severe or compound fractures. It will be noted in the chart showing the Summary of Results (chart IV) that in general the results in the arm fractures were better than in the leg fractures, the good results in the arm being 91.4% and in the leg 80%. This was due largely to two things. The first of these is the fact that the arm fractures occurred largely in children, while the leg fractures were largely in adults. The other reason is that the leg fractures involved weight bearing bones and joints while the arm fractures did not.

No attempt has been made in this paper to go into a discussion of all types of fractures, but merely to discuss some of the more interesting and more difficult problems. It is hoped that the presentation of the results and some of the problems involved in obtaining these results may prove of general value and interest.

Chart I.
FRACTURES OF FOREARM

| Region | Number | Result |
|---|---|---|
| Elbow | | |
| Supracondylar and epicondylar | 5 | 4 good |
| | | 1 fair |
| Olecranon | 1 | 1 good |
| Comminuted of the Joint | 3 | 1 fair |
| | | 1 untreated |
| | | 1 good |
| Wrist | 5 | |
| Colles' Fracture | 2 | 2 good |
| Separation of lower radial Ephphysis | 3 | 3 good |
| Forearm | 21 | |
| Shaft of both bones | 6 | 6 good |
| Shaft of radius alone | 3 | 3 good |
| Shaft of ulna alone | 1 | 1 good |
| Both bones just above wrist complete | 6 | 6 good |
| Both bones just above wrist, greenstick | 3 | 3 good |
| Greenstick fracture of ulna | 1 | 1 good |
| Greenstick fracture, radius | 1 | 1 good |

Chart II.
FRACTURES OF LOWER LEG

| Type | Number | Result |
|---|---|---|
| Fractures into Knee Joint | 2 | |
| Upper surface of tibia | 2 | 1 good |
| | | 1 fair |
| Shaft of Both Bones | 25 | |
| Upper third | 3 | 1 fair |
| (1 comminuted) | | 2 good |
| Middle third | 15 | 1 untreated |
| (3 comminuted, 1 compound, 1 refractured) | | 14 good |
| Lower third | 7 | 1 poor |
| (1 compound) | | 6 good |
| Ankle | 8 | |
| Bimalleolar | 2 | 2 good |
| (1 infected) | | |
| Trimalleolar | 4 | 1 good |
| | | 3 fair |
| Fracture fibular malleolus | 1 | 1 good |
| Fracture of distal tibial epiphysis into ankle joint | 1 | 1 good |

Chart III
25 FRACTURES OF THE SHAFTS OF THE TIBIA AND FIBULA
Analysis of Results of Methods of Treatment

| Type | Number | Result |
|---|---|---|
| Closed reduction | 20 | 19 good |
| | | 1 poor |
| Open reduction | 1 | 1 fair |
| Kirschner wire traction | 1 | 1 good |
| Double fixed traction | 2 | 2 good |
| Untreated | 1 | |

Chart IV.
SUMMARY OF RESULTS—(70 Cases)

| | ARM—(35 Cases) | | LEG—(35 Cases) | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| Good | 32 | 91.4 | 28 | 80 |
| Fair | 2 | 5.7 | 4 | 11.4 |
| Poor | | | 2 | 5.7 |
| Transferred | 1 | 2.9 | 1 | 2.9 |

## SUMMARY

The fractures of the forearm and lower leg and their adjoining joints which occurred at the El Paso City-County Hospital during a period of one year are reviewed.

There were 70 fractures of which 35 involved the arm and 35 the leg.

In the arm fractures there were 91% good results.

In the leg fractures there were 80% good results.

The results are presented, analyzed, and discussed.

Some of the problems encountered and some of the newer methods of treatment are discussed.

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# Lead Absorption and Lead Poisoning II

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PATHOLOGY

*The Blood*: As stated before by far the greatest amount of lead in the blood stream is found in the plasma. It exerts its deleterious effect wholly on the red cells, leaving the white blood cells, as far as has been determined, in a normal state.

The effect of lead on the red cell, as far as they have been able to determine, is on the surface of the cell, giving it a hard surface instead of a very elastic one and causing the cell to lose its normal stickiness. Dr. Aub cited one evidence of this fact to us last spring, in speaking of blood grouping. He said that he is a very strong group, 3 type, and if he exposes his blood to one part in a million of lead, the agglutination is lost. This would make it appear that it would be futile to attempt to type a man with lead poisoning. These leaded cells are enelastic, they do not swell and they do not absorb water because their surface is hard and they become brittle, and as they go through the circulation they break up and are destroyed. As a result some of the blood pigments are lost in the bile, which accounts for the jaundice sometimes seen in cases of lead poisoning. As a result of the blood destruction we naturally get an anemia—a secondary anemia, however, the count rarely goes below 3,500,000 with the hemoglobin at around 70. When you have sufficient destruction of the red cells, it is natural that the reaction of the body will be to increase the number of young cells, and an elevated reticulocyte count, therefore, shows that something is doing damage to the red cells.

McCord a few years ago worked out a method of staining and counting young red cells and called it the basophilic aggregation. We are using this method today and it is one of our best means of diagnosis of lead absorption and lead poisoning. It is accepted in court litigation. A count under 1% is considered normal by everyone. A count of 1%, by some, and 1.5% by others, means that there is enough lead being absorbed to cause concern. At this point some doctors merely keep the men under observation, repeating the counts at 10 to 15-day intervals. Others not only keep them under observation but start a prophy treatment. We at the El Paso plant follow the latter plan. In the El Paso plant when we find a count of 3% or more, we become really concerned and get the man out of lead exposure into some other department and start active treatment to avoid lead poisoning.

The remaining pathological condition of the blood that we find in lead poisoning is stippling. Stippling is caused by the action of lead on the young red cell. A stippled cell is a young red cell in which granules are found. A certain stain is used to bring out these granules. According to Key, these granules are probably aggregation of part of the basophilic substance of the cell into small discrete masses, probably degenerative in its nature. Stippling also occurs in pneumonia in infants, in pernicious anemia, leucemia, pseudoleucemia, and in anemias due to cachexia of neoplasms. Alice Hamilton has found it in aniline poisoning. Its occurrence, however, in these conditions is relatively rare and slight in comparison to plumbism. We use the stippled cell count along with the Basophilic Aggregation Count, and consider that if one stippled cell

Part III is to be published in November Southwestern Medicine. Part I appeared in the September issue.

to every three fields is found we are running into danger.

### THE GERM CELL

The literature indicates that the germ cell is affected in both sexes but that it is only of temporary duration and that shortly after lead exposure ceases and lead is out of circulation, both sexes return to normal. Repeated abortion, however, have been reported in leaded individuals; also that children born to leaded individuals are under par the first three years. The reason probably for premature deliveries and still-births which occur during plumbism is the action of lead on the smooth muscle of the uterus—much the same as with the smooth muscle of the intestines during lead colic.

The lead line is caused by the deposition of lead sulphite typically in the gingiva near the border of the teeth. That the pigmentation is not on the teeth themselves may be easily demonstrated by inserting a piece of white paper between the teeth and gum, and as the lead line cannot be rubbed off it must lie within the tissues. Hydrogen sulphide is a product of putrefaction, especially of animal proteins. There are two sources of this gas in the mouth,—the protein food caught between the teeth and the decay of the gum and teeth themselves. Circulating lead is carried to the gums by the blood and wherever it meets the hydrogen sulphide a precipitate of lead sulphide is formed which constitutes the lead line. We have noted that men who clean their teeth regularly do not develop the lead line even though we know for a certainty that they have lead absorption by their blood count.

Aub in his animal experiments found that rabbits, herbivorous animals, did not develop the lead line even when severely poisoned, but cats, carnivorous animals, had the lead line soon after the administration of lead. In the past and before we started the blood count as a routine examination for lead absorption, I examined the men for the lead line every two weeks.

### LEAD COLIC

The action of lead on the smooth muscle of the intestines is to increase its tonus so markedly that a temporary obstruction is produced. A peristalic wave approaches this obstruction and pressure in the intestine is increased and the colic results. Then that pressure is released and the colic stops until similar pressure occurs elsewhere. Lead colic is always preceded and accompanied by obstinate constipation.

Aub in his experiments satisfied himself that it was the action of lead directly on the smooth muscle, and not on the peripheral ganglia that causes the increased tonus. The constipation is probably caused by the increased tone of the smooth muscle together with a loss of motility.

### LEAD PALSY

Paralysis is one of the most distressing occurrences in lead poisoning. It affects the muscles a worker uses most, usually requires several months to make a recovery, and in some instances, results in a permanent disability. One redeeming feature, however, is the relative rarity of its occurence at the present time. In my work at the smelter over a period of some 11 years, I have had two wrist-drop cases. The first occurred within the first year in a man who had escaped the routine prophy lead examination; the second about a year ago, did not progress further than a disability to three fingers of one hand. Tanquerel des Planches, who reported some 1200 cases of lead poisoning in Paris in 1839, estimated that 19% of his cases developed palsy, and in those days they really had severe lead poisoning, as lead was added to wine in the course of refining.

The ancients attempted to explain the action of lead in the palsies by study of the body tissues in their post-mortem examinations and through their clinical observations but were unable to arrive at any definite conclusion.

Aub and his associates recalled that in their experiments relative to the action of lead on the red blood cell the surface of the corpuscle was so altered as to change its permeability to water and wondered if a leaded muscle might undergo a similar change. They accordingly carried out experiments on isolated muscles and living animals and their conclusions were: That the physiological lesion of lead palsy is in the muscle itself and that those muscles that are fatigued are most susceptible to lead paralysis. Also, that the nerve injury is a primary peripheral injury and secondary central degeneration.

### NEPHRITIS

Dr. Aub told us last spring that Dr. Jarvis Nye has proven that lead poisoning does cause Nephritis. He studied children known to have had lead poisoning, a large percentage of whom died later of Nephritis.

### OPTIC LESIONS

It has been reported that lead causes palsies and cramps of the various eye muscles, as well as blindness due to optic atrophy.

### ENCEPHALOPATHY

Aub in his book states that many cases of lead meningitis have been reported in small children. The spinal fluid showed signs of meningeal irritation. He also states that in one of his cases with so-called Encephalopathy he found .08 mgm. lead in 80 c.c. of cerebro-spinal fluid. He expresses the opinion that the meninges are primarily involved, that in other words the disease is really a meningopathy.

### SYMPTOMS

*LEAD ABSORPTION:*

Slight increase of the basophilic aggregation 1 to 1-½%, the finding of one stippled cell to three fields, a slight decrease in red blood count and hemoglobin. Usually a lead line if there is poor dental hygiene; a slight pallor of face and lips; slight loss of appetite, especially for breakfast;

slight constipation; slight indefinite arm and leg pains; a slight increase of excretion of lead. There may be slight headache, slight weakness and sometimes a metallic taste is complained of.

*LEAD POISONING:*

A Basophilic aggregation count of from 3% to 4% and as high as 6%; a practically constant finding of stippled cells; a red cell count of around 3,500,000 with a hemoglobin of 70; increased pallor; usually severe constipation, loss of appetite and weight. Metallic taste; nausea and vomiting. Abdominal colic quite frequent; marked constipation, sometimes blood in stool. Headache, insomnia, dizziness, irritability. Slight tremor of face or twitching; general weakness and joint pains, muscular pains and soreness. Lead in excreta.

SUSCEPTIBILITY TO LEAD POISONING

Women and children are more susceptible than male adults. The colored race is more susceptible than the white race. Boys under 19 should not be subjected to lead exposure. Men should pass a careful physical examination before being allowed to work in lead. In my own experience I have seen men contract plumbism after two or three weeks exposure, yet there are men in the plant who have worked in the lead department for 20 years without any symptoms of lead poisoning.

Mills Bldg.

*Remember . . .*

the time is almost here

ANNUAL SESSION

Southwestern Medical Association

El Paso, Texas

October 27-28-29, 1938

**Southwestern Medicine**

Vol. XXII. OCTOBER, 1938 No. 10

OFFICIAL JOURNAL
Arizona State Medical Association
New Mexico Medical Society
Southwestern Medical Association
El Paso County (Texas) Medical Society

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Two dollars per year 25c single copy

Entered at the postoffice at Phoenix, Arizona, as second-class matter.
Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized March 1, 1921.

ADVERTISING OFFICES
A. C. Taylor Printing Company
142 South Central Avenue
Phoenix, Arizona

SUBSCRIPTION OFFICES
D. F. Harbridge, M. D.
822 Professional Building
Phoenix, Arizona

Eastern Representative:
Cooperative Medical Advertising Bureau
535 N. Dearborn St., Chicago

## SPECIAL SESSION OF THE A.M.A. HOUSE OF DELEGATES, CHICAGO, SEPTEMBER 16, 1938

For the third time in the history of the American Medical Association, the House of Delegates was called to convene in emergency session. This meeting took place in Chicago, September 16 to 18, 1938. In attendance also were secretaries and presidents of state societies and editors of state journals, by invitation of the board of trustees.

After being called to order by the speaker, Dr. H. H. Shoulders, of Nashville, the assembly was addressed by Dr. Irvin Abell, of Kentucky, president of the American Medical Association. Dr. Abell reviewed the principles of ethics of A.M.A., stating that any plans to care for the sick should not be in conflict with these principles. He further pointed out that the A.M.A. has never opposed the idea of insurance or group hospitalization, but that it did oppose an interposition of a third party, governmental or otherwise, between the patient and his phyisician. Dr. Abell reasserted the sole right of the American Medical Association to speak for American physicians. Dr. Rock Sleyster, of Wisconsin, president-elect of the A.M.A., next spoke, charging that skillful propaganda lay behind most of the moves to change the type of medical practice in the United States. He felt that this propaganda presented only past truths, and wondered if the primary problem of this day shouldn't concern an effort to raise the living standards of the entire population regarding food, clothing and shelter. He enumerated some of the more notable contributions of American medicine to the American public.

After a short discourse by the speaker of the house, various committees were appointed and the meeting was opened to the introducing of various resolutions by the delegates. It was announced that 165 delegates out of a possible 174 were registered and in attendance. At this point the house was addresed briefly by three colored physicians, representing the National Medical Association. They pledged the full co-operation of their society of 5,000 colored physicians with the American Medical Association in whatever its House of Delegates might decide. The committees were at work by this time holding hearings on the various resolutions referred to them. The remainder of the house was addressed the afternoon of the first day by Dr. R. G. Leland, of the Bureau of Economics. He gave a summary of many of the plans and suggestions for changes in medical practice that have been submitted to the Chicago headquarters of the A.M.A. He said that some 3,000 plans had been submitted to date.

Committee sessions were held through most of the first night. There was evident everywhere a spirit of purpose and will to work toward complete solution of the problems besetting the physicians of America.

During the second day various committees began to report to the floor of the house, introducing their recommendations for debate and consideration by the delegates. The term "medically indigent" was defined by one committee. The full definition as well as the complete stenographic report of all proceedings will be found in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, September 24. It is suggested that the reader obtain a copy of this journal and study the complete report of the session contained therein.

The House of Delegates:

1. Recommended the establishment of a department of health with its secretary to be a physician. This cabinet officer would have equal standing with the other secretaries of the president's cabinet.
2. Stated that the expenditure of public health monies should be under the joint control of state health departments and state medical societies.
3. Voted against the spending of money on the health programs for women and children unless said money was allocated to more specific purposes than is done at present.
4. Voted against the appropriation of money for care of individuals unless those individuals are unable to help themselves.
5. Favored expanding hospital facilities where they are actually needed, as determined by the recent hospital survey of the American Medical Association. It was the sense of the house that before any hospitals are constructed by the government that it would be better to utilize the facilities of existing private hospitals. It was pointed out that less than 1.5% of the population of America reside over 30 miles from a hospital. The delegates further said: "The stability and efficiency of many existing church and voluntary hospitals could be assured by payment to them of the costs of the necessary hospitalization of the medically indigent."

6. Approved hospital service insurance, providing it did not include any type of medical care. They said further: "In addition to insurance for hospitalization we believe it is practicable to develop cash indemnity insurance plans to cover the costs of emergency or prolonged illness. Agencies set up to provide such insurance should comply with state statutes and regulations to insure their soundness and financial responsibility, and should have approval of state and county medical societies. We are not willing to foster any system of compulsory health insurance. We are convinced that it is a complicated, bureaucratic system which has no place in a democratic state. It would undoubtedly set up a far-reaching tax system with great increase in the cost of government. That it would lend itself to political control and manipulation, there is no doubt."

7. Resolved that: "We recognize the soundness of principles of workmen's compensation laws and recommend the expansion of such legislation to provide for meeting the costs of illness sustained as a result of employment in industry." It was declared that the attending physician in these cases should not have to certify as to the illness and the ability to return to work of the patient. It was thought that this task should be performed by a salaried, full-time physician connected with the agency administering compensation for time lost from employment due to illness.

8. Recognized the principle that the indigent should be completely cared for by tax funds whether appropriated from a federal, state or local source. States would be encouraged to organize their own health programs along this line, obtaining, if necessary, financial aid from federal funds.

9. Endorsed no one scheme of health insurance, feeling that local problems should be handled by local medical societies.

10. Appointed a committee of seven physicians to consult with federal authorities regarding the national health program. This committee is to present the views of 110,000 American physicians as represented by the governing body of the association, the House of Delegates, to the interested representatives of the national government. This committee is composed of Dr. Irvin Abell, chairman; Dr. E. H. Carey, of Dallas; Dr. Walter E. Vest, of West Virginia; Dr. Walter Donaldson, of Pittsburgh; Dr. Fred Rankin, of Kentucky; Dr. Fred Sondern, of New York City, and Dr. Henry A. Luce, of Detroit. Five of these men headed important reference committees in the special session of the House of Delegates and heard several hundred presentations of views by those in attendance at the session.

The resume here given represents the united answer of organized medicine to all its critics. Highly evident at the Chicago session was the spirit of work and frank facing of a difficult problem. Various men served faithfully and indefatigably in long, tedious hours of committee work in an effort to provide their constituents back home a definite, reasonable program which they may ethically carry out. Thus it can be said now that the House of Delegates of the American Medical Association has spoken, as is its sole right, for the medical profession of this country. It behooves every physician in this country to study the complete report of the Proceedings, to think over its many implications and then conduct himself in strict accordance with the principles as enumerated in the report. For some time American medicine has been put on the defensive, a position which is totally foreign to the nature and training of the medical man. Now each practitioner in America has definite principles with which he can answer any and all criticisms directed his way by any agency, be it lay or professional. Study of the Proceedings will lead to the conclusion that the American Medical Association has spoken forcefully and reasonably. It remains for the individual member to reaffirm his allegiance to his Association by so living and doing that he comes into full accord with the principles enunciated by his spokesman. American physicians gained immeasurably in prestige as a result of the recent Chicago conference.

## EL PASO SESSION OF SOUTHWESTERN MEDICAL ASSOCIATION

Elsewhere in this issue there appears the program for the annual fall session of the Southwestern Medical Association, to be held this year in El Paso at the Hotel Cortez. The meeting opens Thursday morning, October 27, and ends Saturday afternoon, October 29. Seven well-known teachers, with university connections, will appear as honored guests. They will conduct a highly valuable postgraduate course for a period of 2½ days. There will be something of practical value for every physician in attendance. Displays will be more interesting than ever. A full round of extra-mural entertainment has been planned for visitors. It is urged that reservations be made immediately. This may be done by writing Hotel Cortez, El Paso, Texas

*Special Section*

# Arizona State Medical Association

J. D. HAMER, M. D.
*Associate Editor*

## CLINICAL CONFERENCE, SAGE MEMORIAL HOSPITAL

One of the most interesting of the medical meetings of the Southwest was held at Ganado, Arizona, on August 29th, 30th and 31st, being the third Harlow Brooks Memorial Navajo Clinical Conference at the Sage Memorial Hospital.

Physicians in attendance came from northern Arizona, New Mexico, six from Phoenix, and others from Chicago, New York, Detroit, Lincoln, Nebraska; Temple, Texas and California.

Operations were performed by Dr. Fred H. Albee of New York, including spinal graft for Pott's disease, arthrodesis of knee joint for tuberculosis, and

open operation for ununited fracture of the humerus. Motion pictures shown included operations for removal of sarcoma of the jaw, and reconstruction of the jaw, graft for ununited fracture of the patella, graft for ununited fracture of the femur, operation for treatment of urinary extravasation, operations for treatment of lesions of the oesophagus, and for treatment of rectal abscess and fistula, for the removal of stones from the kidney and for the surgical treatment of nephroptosis. Following is the program presented:

MONDAY MORNING
August 29, 1938

Operating Schedule

8:00 Operation for ununited fracture of the femur performed by
FRED H. ALBEE
*New York City and Venice, Florida*

9:30 Thyroidectomy performed by
GROVER C. PENBERTHY
*Associate Professor of Clinical Surgery*
*Wayne University College of Medicine,*
*Detroit, Michigan*

10:30 Ward Walk with
FRED H. ALBEE
*New York City*

MONDAY AFTERNOON
August 29, 1938

1:00 Welcome to Speakers and Guests
LOUIS H. EVANS, D. D.
*Pittsburgh, Pennsylvania*
*President, Board of National Missions*
*Presbyterian Church, U. S. A.*

1:15 "The Development of the Work of Sage Memorial Hospital and the Harlow Brooks Memorial Navajo Clinical Conference"
PHILIP LEE TRAVERS
*Gallup, New Mexico*
*Chief Surgeon, St. Mary's Hospital*

1:45 "Bone Sarcoma"
BOWMAN C. CROWELL
*Chicago, Illinois*
*Associate Director, American College of Surgeons*

2:30 "Urinary Extravasation" (with Motion Picture Demonstrating Surgical Technique)
CARL RUSCHE
*Los Angeles, California*
*Associate Professor of Clinical Surgery*
*University of Southern California*
*School of Medicine*

3:15 "Local Anesthesia in Major Surgery"
J. H PATTERSON
*Phoenix, Arizona*
*Secretary, Arizona State Board of*
*Registration in Medicine*

TUESDAY MORNING
August 30, 1938

8:00 "The Management of Certain Lesions of the Esophagus" (with Lantern Slides)
GROVER C. PENBERTHY
*Detroit, Michigan*

8:45 "Proctology for the General Practitioner"
WILLIAM H. DANIEL
*Los Angeles, California*
*Associate Professor of Proctology*
*College of Medical Evangelists*

9:30 "Reconstruction Surgery of the Skeleton"
FRED H. ALBEE
*New York City*

10:15 Ward Walk
with CARL RUSCHE
*Los Angeles, California*

TUESDAY AFTERNOON
August 30, 1938

1:00 "Surgical Treatment of Nephroptosis" (with Colored Moving Pictures)
CHARLES H. ARNOLD
*Lincoln, Nebraska*
*Secretary, International College of Surgeons*

1:45 "Observations on Another Method of Pinning Fractures of the Neck of the Femur"
JOSEPH MADISON GREER
*Phoenix, Arizona*

2:30 "A Plea for an Early Diagnosis and Radical Treatment of Gastric Carcinoma"
E. PAYNE PALMER
*Phoenix, Arizona*
*Chief Surgeon, St. Joseph's Hospital*

3:15 "Bronchography in Diagnosis of Pulmonary Disease"
VICTOR S. RANDOLPH
*Phoenix, Arizona*

WEDNESDAY MORNING
August 31, 1938

Operating Schedule

8:00 Operative Clinic by FRED H. ALBEE
(a) Spine Graft
(b) Arthrodesis of Knee Joint
(c) To be announced

Everything possible was done by Dr. C. G. Salsbury and Mrs Salsbury of the Sage Memorial Hospital to make all of the visitors comfortable and a pleasant and instructive conference was enjoyed by all who attended

Note: Papers read at this Conference will appear in this section as space permits.

## HYPERTONIC SUCROSE SOLUTION FOR THE REDUCTION OF INTRACRANIAL PRESSURE

### Report of a Case

LESLIE R. KOBER, M. D.
*Phoenix, Arizona*

Since the introduction of concentrated glucose solution in 1922 for the reduction of intracranial pressure, there has been much discusison as to its efficiency, chiefly due to its transient effect and the secondary rise in intracranial pressure. In spite of objections 50% glucose solution intravenously has become accepted by many[1] as a standard procedure for the reduction of intracranial pressure.

Numerous experimental and clinical reports of the advantages of sucrose over glucose for the reduction of intracranial pressure have been published since 1934[1] and it would seem that sucrose is now the sugar of choice for this purpose. Its advantages are stated to be:

1. A prolonged reduction of intracranial pressure.
2. No secondary rise in intracranial pressure.
3. No appreciable absorption of the sugar by brain or body tissues.
4. More effective diuresis, dehydration, and reduction of intracranial pressure.

Sucrose is now being used prior to operations on the brain just before opening the dura.[2] It is being used in certain cases of hypertension or in chronic

Presented at Staff Meeting of Good Samaritan Hospital, Phoenix, Arizona, September 26, 1938.

nephritis with hypertension[3] for the relief of headache and convulsions. However, its use in cases of acute brain injury[1] seems to be its most practical application.

In doses of 100 c.c. of the 50% solution intravenously sucrose has proved quite effective, and can be repeated as frequently as pulse, blood pressure, respiration, or clinical signs such as depth of coma and motor activity seem to indicate.

### REPORT OF A CASE

Case No. A white male 33 years old fell from an electric power line tower following contact with 2300 volts, landing on his head, was unconscious for a few minutes, regained consciousness and then lapsed into a comatose condition three hours after admission to the hospital. In the meantime a wound on his scalp was dressed after a probe revealed no depression of the skull. The head of his bed was moderately elevated, he was given magnesium sulphate by mouth and special nursing care with frequent blood pressure and pulse readings. After he became comatose there was a positive bilateral Babinski, his blood pressure dropped to 106/60 and his pulse slowed to 55 per minute. During the next few hours he became quite restless exhibiting considerable motor activity. He was given 50 c.c. of 50% sucrose intravenously following which he slept quietly. 100 c.c. of sucrose was repeated later that evening and again the next morning, both times with a quieting of his irrational talking and excessive motor activity. His blood pressure continued about 110/60 with pulse ranging from 44 to 58 for the next three days, at which time he regained consciousness and his pulse returned to a normal rate. For several days he continued some loss of memory and some headache which was relieved by codeine and aspirin. Ten days following the accident he showed no evidence of brain injury or memory defect, pulse and blood pressure were normal. An x-ray taken about one week after the accident showed a 3-inch fracture of the right side of the skull.

I felt that the intravenous sucrose had proved a big help in reducing the clinical symptoms indicative of intracranial pressure and probably in preventing serious sequellae.

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## LOCAL ANESTHESIA IN MAJOR SURGERY

By J. H. PATTERSON, M. D.

It is not my purpose to dwell so much upon the technique of Local Anesthesia, but rather to stress more its value to the patient and the various types of operations possible and commonly done by some surgeons under this type of anesthesia. I wish also to discuss to some extent the comparative post operative complications with Local Anesthesia as compared to inhalation anesthesia. The technique of local has been so well and masterfully described by Dr. Farr of Minneapolis, that anything said by me would be superfluous. Further, I feel that one of the best ways to learn the really fine points of local is to work with some one of wide and successful experience in this field. More can be gained in one active week's time in this manner than by months of reading. This statement, however, is predicated upon the supposition that one would have good sound surgical skill and training as a foundation to build on. Much criticism has been heaped upon local by many men, but I feel that if they would but become more familiar with its technique and value they would cut their death rate way down and afford their patients a much more comfortable and easier convalescence. What I am about to say is not to be taken as a condemnation of any or all types of General Anesthesia, as they have their very definite field in Major Surgery.

To my mind one of the greatest advantages of Local Anesthesia is that it is impossible to successfully operate under this type of anesthesia with rough hands. In other words, you cannot traumatize tissues and successfully finish your operation. The patient will not permit you to handle their tissues roughly. It always disturbs them and causes them too much discomfort. This brings forth the axiom that no man should be permitted to operate unless he can successfully operate under local. This does not mean that he must necessarily operate all his cases under local but that he should have such skill and smooth, gentle, technique that his patient would not suffer because of rough and haphazard handling of tissues, something that all of us have seen so commonly in nearly all operating rooms.

We all know that traumatism causes adhesions and even shock, and that everything possible should always be done to prevent these two complications. It also makes tissues heal more slowly and poorly, and makes infections more likely.

Probably the outstanding value of local is the comparative lack of post operative complications and the smoothness and rapidity of convalescence. I have many times asked nurses which type of operative patients they would rather take care of, "Local or General", and I have yet to find one who does not prefer the former because they are so much easier to handle and care for. This does not mean that all local cases are easy or that all general cases are hard to handle postoperatively.

In 1928 and 1929 I was associated with Dr. W. O. Sweek, who is one of the pioneers in local anesthesia in this part of the country. While with him we made a study of the post operative complications and mortality rate in a series of 1000 cases. Five hundred done under local and five hundred done under general. In order to get this number of cases it was necessary to study 2000 charts, half of which were thrown out for inadequate or incomplete charts from which it was impossible to get the true convalescence, or post operative complications. The complications were either not clear or certain or the chart was so poorly kept up that we did not feel it fair to use the case.

The score board used in this work showed the highest temperatures and pulse recorded. The approximate number of times nausea and vomiting took place, and the number of times abdominal distention was recorded on the progress sheet, and nurses bedside charts. Also post operative chest complications such as: Pneumonia, bronchitis, and atelectaisis. We might add here that we could keep no accurate check on the number of times atelectaisis took place for the obvious reason that it goes unrecognized so often, I feel that at least partial atelectaisis takes place many, many times and goes unrecognized by the surgeon, and that also it is probably true the type of anesthesis has nothing to do with it whatever, but rather that it is caused more from traumatism, shock and extensive sur-

Read at Clinical Conference, Sage Memorial Hospital, Aug., 1938.

gery. Heart and kidney complications were also recorded as were infections, the average number of days in the hospital, and the deaths.

In this paper only a few high lights will be given on these phases, however, and a more complete and detailed report given at a later date on the data obtained from the study of these cases.

The outstanding features that are impressive will, however, be mentioned here. One fact that may not appear to be of much importance or significance until analyzed is the fact that the average highest temperature recorded in the local cases was one degree less than that recorded in the general cases. I feel that this is best and most easily explained by the fact that there is so much less traumatizing, mauling and handling of tissues under local than there is under general. The study quoted above also showed wound infections much less frequent, which is undoubtedly explained in the same manner. Nausea and vomiting were far less frequent and abdominal distention was much less severe.

It might be well to bring out at this point that, as we all know, there are certain contra indications to inhalation anesthesia, such as bad heart, lung infections, etc., which we run into many times in this particular section of the country where we see so many health seekers.

About the only contra indications to local anesthesia is the neurotic or extremely high strung or imaginative patient and a surprisingly large number of these types can be handled very nicely under local in spite of their temperamental make ups. I have also seen some cases of massive and badly frozen and inflamed pelves, in which one cannot get an effective block, that are impossible to do under local. However, on the whole there is practically no type of abdominal or pelvic operation that cannot be done under local infiltration anesthesia by a skilled operator. This includes: hysterectomies, pan hysterectomies, partial gastric resections, gastro-enterostomy, cholecystectomies, common duct operations, spleenectomies, bowel obstructions, and caesarian sections, etc.

In some types of patients the operations are necessarily shown and more tedious but this in no way has a deleterious effect on the patient. Even occasionally when a patient gets unruly on a table, and this will happen some times and is usually caused by bad reactions to the pre-operative narcotic. I have never seen a patient go into shock from this nervous or hysterical reaction, however. It is in this type of patient that it is sometimes hard to get good relaxation. However, on the whole relaxation is much more satisfactory than with any type of general anesthesia. Here again, however, we are dependent upon the skill and technique of the operator. Any surgeon who has taken the time and patience to learn local anesthesia never has any trouble with relaxation except in the above type of case.

I believe at this time it would be of real interest to quote some figures on a series of operations done by me which in a measure will substantiate the above statements concerning the real value of local anesthesia.

This data was gathered and compiled by my associate, Dr. L. L. Tuveson, from records of these cases on file at St. Joseph's Hospital and the Good Samaritan Hospital in Phoenix, Arizona. They consist of 470 consecutive cases done under General, that is Gas and Ether, and Spinal, and Local infiltration anesthesia.

This series is divided into 122 appendectomies done under local, two done under local general, for example two that were started under local and had to be finished under general—in other words, we were unable to finish the job under local; two done under spinal, and thirty done under general, a total of 156 appendectomies. These cases consisted of chronic, acute and ruptured cases. The percentage being about the same for each type of anesthesia. There were two deaths in this group, one of massive collapse of both lungs, who died on the table, under ether anesthesia, and the others were a ruptured appendix with a streptococcus infection done under local.

There were 165 multiple or gynocological operations consisting of perineorrhaphies, hysterectomies, salpingectomies, suspensions, oophrectomies, and appendectomies. That is combinations of these or all of them were done at one time. Ninety-nine were done under local, eleven more were started under local and had to be finished under general, eleven were done under spinal and forty-four under general, making a total of 165 cases. There were six deaths in this series. One of them under local, who developed a paralitic ilius and obstruction, and one under spinal anesthesia who died on the fifth day of a mesenteric thrombosis. The other four were deaths under general anesthesia. One of these dying on the 8th day from an embolism, one had a streptococcic abscess of the pelvis and died the same day of the operation, and two died of a paralitic ilius.

There were a series of thirty-six hernia operations, twenty-nine under local and seven under general with no deaths.

There were eleven thyroidectomies, ten done under local and one under general with no deaths.

There was a series of twelve gall bladders and ten gall bladders and appendices, making twenty-two in all. Sixteen done under local and six under general with no deaths.

There were twenty-two orthopedic cases consisting of open reductions, and laminectomies, nine done under local and thirteen under general.

There were fifteen cases, consisting of partial gastric resections, gastro-enterostomies, ruptured intestinal obstructions, etc. Eight were done under local and seven under general. There were three deaths in this series, two under general, one dying of a combination of general peritonitis, ilieitis, and mechanical obstruction, and another from a paralitic ilius and mechanical obstruction. The other death was under spinal. This was a mechanical obstruction from an old gun shot wound and undoubtedly should have been saved, but I missed the diagnosis and held off the operation too long.

There were three caesarian sections, two done under local and one done under general with no deaths.

There were thirty miscellaneous operations such as liver abscesses, subphrenic abscesses, rib resections, traumatic injury to the abdomen such as ruptured liver and gun shot wounds and etc. Eighteen of these were under local, two under spinal and ten under general, with one death. This death occurred from a ruptured liver, and was operated on under general anesthesia.

Summing up the 470 cases, there were twelve deaths, giving a death rate of 2.55% with all types of anesthesia. There were 131 of these cases done under general with eight deaths, giving a death rate of 6.1 per cent. In 323 cases done under local there were two deaths, giving a death rate of .619. Sixteen cases were done under spinal with two deaths, giving a death rate of 12.5%.

I feel that in fairness the spinal cases should all be thrown out in so far as the death rate comparison is concerned, as practically all of them were very difficult cases. The general and local cases, however, ran about the same, there being a lot of easy ones and a lot of hard ones in both series. There were thirteen cases in all types of operations that were started under local and had to be finished under general. Two of these cases died, one

was classed as a local death and one was classed as a general death.

CONCLUSION

For comparative purposes it can be readily seen that all of these cases being done by the same surgeon, and with one series being done under local, showing a death rate of .619% and another series being done under general with a death rate of 6.1, one is bound to arrive at the conclusion that local anesthesia is by far safer and much better for the patient, and should certainly be given serious thought and consideration by the general surgeon who has the welfare of his patients at heart, rather than the comfort and ease of his own feelings. For local anesthesia is undoubtedly harder on the surgeon who does it.

## MISCELLANY

### COME, COME, MR. ARNOLD!

No one who understands Mr. Thurman Arnold's excellent showmanship or who has seen him stride blithely into any spotlight is at a loss to find his motive for directing the big guns of the Department of Justice at the American Medical Association. The band wagon of medical care occupies an important position in the parade of social reform and it was inevitable that as it passed by Mr. Arnold would hop aboard, pick up a big horn and, for better or worse, start tooting.

No profession is so surrounded by self-imposed restrictions as medicine. These restrictions have developed through centuries of experience and are for the protection of the people, it is always a little difficult for our legal friends to understand this. The American Medical Association is a voluntary organization. Membership in it is not obligatory. When a physician joins it he must perforce subscribe to the rules of behavior that are established. If he does not care to do this, he need not join. If, after becoming a member, he finds the rules interfering with his productive conduct, he is at full liberty to resign or to use his influence to have the rules revised. To call a voluntary organization of this kind a "trust" and a combination in restraint of trade seems a little far fetched, and if this is the best Mr. Arnold can do in his great trust busting campaign, it might be better for him to return to New Haven where he has enjoyed some reputation as a colorful teacher of law.

If this was just a smart gesture on Mr. Arnold's part, it might be condoned, but the whole affair is unfortunate and will prove a hindrance. There is little question that the distribution and compensation for medical care is inadequate and can be improved, and the groundwork for necessary changes has been rapidly laid. It is a problem in which we are all vitally interested, physicians and public alike, its solution will come by honest, unselfish thinking, political skulduggery will not help.—*Jo. Conn. St. Med. Soc.*

### DANGERS OF PROTAMINE INSULINS

Reports of reactions following the use of protamine zinc insulin have appeared in considerable number. In one of the earlier discussioons of protamine zinc insulin it was reported that hypoglycemia from this type is more subtle in onset and on the whole subjective symptoms are less severe than with soluble insulin. Prelminary symptoms of shakiness, sweating and palpitation may be absent; thus severe hypoglycemic symptoms may appear without warning. Ample evidence is now available that protamine zinc insulin is not a fool-proof substitute for the older preparation. Although reactions to it seem to appear with less frequency, they also are often characterized by the suddenness of onset, delayed and therefore unexpected appearance, and symptoms precipitated by exercise at such a distant time as also to be wholly unexpected. Although the development of protamine zinc insulin is an advance of unquestioned value to many diabetic patients, the possibilities of delayed severe reactions cannot be ignored.—*(J.A.M.A.)*

### AMERICAN DOCUMENTATION INSTITUTE

During recent years, the flood of scientific and technical literature has been so overwhelming that, on account of the space restrictions of the technical magazines and the high cost of printing books and other documents by conventional methods, it has been impossible to make the whole of it readily available to those who might find certain parts of it of interest and value.

In order to meet this need, the American Documentation Institute, ("A. D. I.") of Washington, D. C., has inaugurated an *auxiliary publication service*, whereby the editors of journals in any technical field are enabled to publish, without cost to themselves or to the authors, articles which, by reason of their length or the number of illustrations, graphs, or other supporting material accompanying them, could not be printed in full in the journals without entailing prohibitive expense.

Any editor, after deciding that such an article is suitable for publication in his magazine, makes up his mind how much of it he will actually print in its pages, and sends the rest of it to the A.D.I., where it is placed on file in the Library of the U. S. Department of Agriculture, given a permanent Document Number, and a cost price is set for reproducing it by microfilm, photoprint, offset printing, or any other method which will be least expensive.

The editor then places a footnote to the part he is going to print, giving the Document Number and the prices at which the entire article may be obtained, in the most popular forms of reproduction. The author, or anyone else who desires a copy of the complete article or the accessory material, can then order it directly from the Institute, referring to it by number and remitting the exact cost price of the form of reproduction he wishes.—*Clin. Med. and Surg.*

### GOVERNMENT MEDICINE

For many years we have heard that government medicine was inevitable in this country. Theoretically it sounds good to many who know little of the practical side of the subject. Unfortunately there are men in our own profession whose names have become prominent because of some special position they have held or work they have done who express themselves freely in favor of this system of medical practice. A close study of these men will usually reveal the fact that they know little of the practical working of this system either as to the cost to the government or service to the public.

During this era of depression and recession it is easy to stir up the public on matters of this sort. Only the unfavorable side of the present system of practice is presented to them. The comments of such men as Beverly Smith, in the *Reader's Digest*, the serial stories in *Liberty*, inspired by Macfadden and written by a doctor plainly not capable of speaking for the profession; the argument of Cronin in the *Citadel*, condemning physicians for not accepting a physicist as an authority in the highly specialized work of collapsing the lung, are given such wide publicity that the public cannot be blamed for their misapprehension of the real facts.

We cannot deny that there are such shortcomngs in our profession, but in what profession or walk of life do we not find deficiencies? The great difficulty here is that these men have made "moun-

tains out of mole hills" and have led the public to believe they are revealing something that has been a closely guarded secret. No profession or group of individuals has less to conceal than does ours, unless it is the confidence between the physician and the patient.

The small group of physicians who have taken it upon themselves to speak through the public press for the profession, unfortunately are mostly out of touch with the real practice of medicine.

They suggest that government controlled medicine would furnish more for preventive medicine. medical education, research, hospitals and diagnostic services. If they had made a careful study of the cost of medical care under government control, they perhaps would realize that not much would be left for extra service of any kind.

Dr. Scammon of the University of Minnesota, after a careful survey, estimated that government controlled medicine in Minnesota alone, in 1934, would have cost the state $20,000,000, or one-half the entire state tax levy. He has shown further that the average family spends per year for luxuries the following:

| | |
|---|---|
| Motor car | $150.00 |
| Tobacco | 67.00 |
| Candy | 37.00 |
| Drinks and chewing gum | 34.00 |
| Radio and music | 25.00 |

In comparison to these figures he has shown that the average family spends only $24.00 a year for physician's fees.

The committee on the cost of medical care led the public to believe that the cost they suggested was for doctors alone. Analysis of these figures show that this cost included hospital, nursing and dental care and all other expenses encountered by the sick patient. The physician received only 29.8 cents of each dollar included in their cost of medical care.

So far as better medical care under government control is concerned, it has been definitely shown that this is not true in the countries in which it has been tried.

Germany today has government control of medicine, yet their death rate is 12.3 per 1000 population; while at the same time in the United States the death rate is only 10.7 per 1000 population. Also it has been shown that 40 per cent of all money spent for medical care in Germany goes to politicians and other non-medical men, while only 60 per cent goes to the physician who must assume all responsibility for the care of the sick.

These few medical men who have taken it upon themselves to put out information in regard to the deficiencies of our present system fail to mention the fact that 125 million dollars is paid out annually to various healers other than physicians, and that 350 million dollars is paid out annually for patent medicines.

There is no reform suggested by any of these Medical Reform Committees that could not be included in our present system. How ridiculous does it seem when we consider the number of years a medical man must spend in learning his profession to have him and his profession controlled and dictated to by individuals, many of whom have had no education at all. This would be the situation under Government Controlled Medicine.—*Journal-Lancet.*

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## NEWS

### *General*

The International Physicians' Luncheon Club of New York extends a most cordial invitation to physicians visiting New York to be honored guests at luncheon, at the same time offering the services of the members of the club for any information they may desire.

While guests are not requested to make speeches, any useful information they wish to give informally will be greatly appreciated as fostering medical progress and international goodwill among physicians from all over the world.

Luncheon is served at the International Medical Center, 135 East 55th Street, New York, every Tuesday punctually at 1 o'clock, and is over about 2 o'clock. Physicians are requested to inform the club of their presence in the city not later than 9 A. M. any Tuesday by telephoning Wickersham 2-7900, or writing International Physicians' Luncheon Club, 135 East 55th Street, New York.

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The Milk Industry Foundation has released figures showing that the United States is one of the ranking nations in the consumption of dairy products. With per capita consumption of fluid milk at 153 quarts a year, America tops all other countries except Switzerland with 232 quarts.

Annual per capita milk consumption in quarts for other nations is: Denmark, 144; Czechoslovakia, 136; Netherlands, 120; New Zealand, 112; Great Britain, France and Germany, 92; Australia, 88; Belgium, 68, and Italy, 28.

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The Medical Corps of the United States Navy offers a number of internships and commissions to graduates of Class "A" medical schools. Examinations will begin on November 7. Applications should be filed at least one month prior to that date.

Qualified candidates who have completed internships in civilian hospitals will be commissioned as assistant surgeons with the rank of lieutenant (junior grade) and assigned to the Naval Medical School, Washington, D. C., for a postgraduate course of instruction.

Senior medical students who qualify for appointments to internships in Naval Hospitals will be appointed acting assistant surgeons with the rank of lieutenant (junior grade) for temporary service during the intern year, and upon satisfactory completion of internship will be allowed to appear for competitive examination for permanent appointment. Should an intern desire to return to the practice of medicine in civil life, his appointment as an acting assistant surgeon will be terminated and he will be honorably discharged from the Naval Service.

Candidates must be United States citizens between the ages of 21 and 32 years at the time of appointment, and pass a physical and professional examination. Officers of the rank of lieutenant (junior grade) without dependents receive compensation of $2,699 per year, while those with dependents receive $3,158 per year. There are additional cash allowances.

Further particulars can be obtained by writing

to the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Dr. Frederick C. Warnshuis, president of the American Medico-Legal Association, has announced that the first issue of *The American Journal of Medical Jurisprudence*, of which he is editor-in-chief, will be published in September and monthly thereafter. The association plans to inaugurate direct research and studies in the field of legal medicine, devise uniformity in policies, standards and legislation in medico-legal matters and to assume leadership in educational movements which convey authentic information on the legal responsibilities and rights of medical, legal and dental members of the professions. Dues, which include a subscription to *The Journal of Medical Jurisprudence*, are a registration fee of $5, paid once, and annual dues of $10. The association headquarters are at 137 Newbury Street, Boston, Mass.

## *El Paso*

The first regular meeting of the season 1938-39 of the El Paso County Medical Society was held at the Hilton Hotel September 12. A dinner preceded the formal session. The program follows:

1. Bronchoscopy as an Aid in General Diagnosis, Dr. M. P. Spearman.
2. Syphilitic Endocarditis of the Mitral Valve, Dr. W. W. Waite.
3. Report of Activities of the Executive Committee to Date, Dr. W. H. Stevenson.

A special meeting of El Paso County Medical Society was held September 5, at which session was held a discussion of the proposals scheduled for consideration by the Special Session of the House of Delegates of the A. M. A. Dr. Felix Miller, of El Paso, is one of the Texas delegates.

Dr. Raymond Hughes is spending six weeks in post-graduate work in Dermatology in New York City.

Dr. J. W. Tappan has resigned as director of El Paso City-County Health Unit, effective September 15. His successor was to be named from a list of six applicants, all bearing the endorsement of El Paso County Medical Society. Dr. L. T. Cox was elected to the post by the County Commissioners' Court and the El Paso City Council.

Dr. I. M. Epstein has been named director of the Child Guidance Clinic, sponsored by the school board of the City of El Paso.

## *BOOK NOTES*

The following books have been received:

ESSENTIALS OF PRESCRIPTION WRITING: By Cary Eggleston, M.D., Assistant Professor of Clinical Medicine, Cornell University Medical College New York City. Sixth edition, revised; 155 pages. Philadelphia and London: W. B. Saunders Company, 1938. Cloth, $1.50 net.

SURGICAL DISEASES OF THE MOUTH AND JAW: By Earl Calvin Padgett, B.S., M.D., F.A.C.S., Associate Professor of Clinical Surgery, University of Kansas School of Medicine, Kansas City, Kansas; Associate Professor of Oral Surgery, Kansas City Western Dental College, Kansas City, Missouri. 807 pages with 334 illustrations. Philadelphia and London: W. B. Saunders Company, 1938. Cloth, $10.00 net.

THE LIFE OF CHEVALIER JACKSON: Autobiography by Chevalier Jackson, M.D., etc. 229 pp. with 64 photographs and 16 full color reproductions of the author's own paintings. Dallas: The Macmillan Co., 1938.

The young man beginning in medicine, the middle-aged man in active practice, the old man approaching retirement—these may all find in this book encouragement, hope and thrills in the narrative of an active medical life pursued to a glorious end by one of the greatest physicians America has ever produced. The well-deserved honors heaped upon Chevalier Jackson by the entire civilized world need no recounting here. It is in a sense marvelous to behold these honors bestowed upon the small frail boy Jackson describes in his early chapters. Through his entire life, as depicted in the book, there runs the twin threads, decency and clear thinking. Any medical reader of this book will understand the life-long trials, disappointments and struggles of the author, who was destined to one day achieve brilliant heights.

Perhaps this reviewer has given the impression of enthusiasm regarding this autobiography. That enthusiasm is well merited, as anyone who spends a fascinating hour or two in the study of this book must readily admit.

The humanity of Dr. Jackson stands out in every paragraph. This man of medicine has attained those ideals which men preach about and upon which Christ founded a church. Thousands of children alive and hearty today, who would have been in their graves but for Dr. Jackson, are adequate testimonials to the greatness of this man. The reader in contemplating this will feel constrained to tread softly as if in the presence of a mighty mystery. He must conclude that there was a Christ-like essence in Dr. Jackson's life, and he will regretfully wish that all men could be nearer in character to this great man than they are.

The publishers have rendered themselves honor and service in bringing this book to the readers of America. Herein they have selected one worthwhile manuscript from the ocean of urges to tell secrets in print by squads of our medical colleagues. —*S.*

## *CLINICAL CASE REPORT*

### TRICHOMONAS PROSTATITIS

WM. DODD ANTHONY, M. D.
*Gallup, New Mexico*

Thompson's report[1] of 104 cases of Trichomonas Vaginalis infection in the male has prompted this case report; which, with his case brings the total to 106.

A Mexican male, age 32, called me to his house February 11, 1937, with a complaint of back injury. He stated that the day before he had suddenly de-

veloped a severe pain while pushing a heavy load of coal in a mine where he worked. He said that there had been a sharp pain and then he had been unable to walk, and had to be brought home by friends who had a car.

The patient was in bed on his side with his legs drawn up, and gave expression of a great deal of suffering. Inspection of his back elicited nothing abnormal. Palpation about the lumbar spine caused him to cry out, but there was no other evidence of injury. He denied any recent illness, or venereal disease, and insisted that he had been very badly injured because he had to push heavy loads of coal. Further examination elicited nothing unusual except palpable epitrochlear nodes, and tender hypertrophied femoral nodes. Blood was obtained for Wassermann, which was later reported negative. He was given salicylate, hot compresses to his back, and because of the severe pain, which seemed markedly out of proportion to his physical findings, nembutal gr. 1½ twice daily. The following day the patient claimed he was no better. Prostatic examination at this time demonstrated a very large and very tender gland, with expression of thick discharge from which smears were obtained. Dry smears were positive for gram negative intracellular diplococci.

It was thought that possibly heavy work had exaggerated an old gonorrheal prostatitis, and that this was responsible for what the man believed was an injury. He was put on Pyridium, hot sitz baths, abundant fluids, aspirin, and warm potassium permanganate irrigations. A few days later he was able to be brought to the office, but walked slowly, was bent over, and manifested much pain. The prostate was massaged gently, he broke out in a profuse sweat, and complained bitterly. The following day he was given an Elliott treatment,which he tolerated very well. The next day there was a penile discharge, however, he said that he felt better. He returned every three to four days for further therapy, and received in all five Elliott treatments. It was estimated that the man had now improved about 50%. The patient continued to insist that the heavy work that he was compelled to do had caused an injury to his spine, and remarked that he was going to sue the coal company. X-ray of his back elicited no evidence of bone injury; however, his prostate was visible on the film and about the size of a large orange. Wet prostatic fluid was examined and numerous Trichomona were present.

It was then explained to the patient that his back complaint was undoubtedly due to the prostatic infections, and that apparently he had no grounds for suit. He continued to insist, however, that his trouble was due to injury, and said that he had obtained a lawyer. A few days later he was examined by two physicians who concurred that the infections were obviously responsible for his condition.

The patient then went to another doctor, and after describing his alleged injury asked for a written statement, under the pretense of using it to obtain government relief. In sympathy for the patient the physician gave the man a paper stating that after a thorough examination he had found that the patient had sustained a severe injury to his back and was unable to work, and not likely to be able to return to work for another two months. With this the patient returned to his lawyer and informed the coal company that he was going to sue. The miner did not return to me for further treatment, but I was able to get his wife to come for examination, and found that she was loaded with Trichomonas Vaginalis.

In the meantime the man settled with the coal company for $50.00. Following this he was deported to Mexico for having entered the United States illegally. No information was obtained about the outcome of the infections.

## SUMMARY

(1) This is a case of Trichomonas Prostatitis which threatened a law suit through an alleged injury, and from which the patient was able to secure a settlement of $50.00.

(2) Elliott treatments are apparently of therapeutic benefit in T. Prostatitis.

(3) The patient's wife was found to harbor T. Vaginalis.

(4) If Thompson's figures are correct, this is the 106 case reported of T. Vaginalis infection in the lower genital tract of the male.

REFERENCE:

1. Thompson, Robert F.: Trichomonas Vaginalis Infestation in the Male, S. W. Med. 22:133, April, 1938.

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# SCRAPS

ED. TO CHICAGO

On the Sunshine Special Tuesday night, and so to work on a long paper by Goodwin of El Paso, at long last very sleepy . . . meeting Mathews of Abilene, with his wife and daughter . . . Felix Miller of El Paso proud of his pocket photo entitled "Nude Deal", the same greatly amusing our conductor . . . White of Dallas, going home after a California vacation . . . Holman Taylor greeting us in Fort Worth, he to go up North later in the day . . . fellow-passengers straining to hear the war news over the radio . . . Graves of Louisiana, telling stories as the big river sparkled by the Pullman window . . . Bertner, prexy of Texas State Society, waving from another train in Texarkana . . . the Chicago Special out of St. Louis, going a mile a minute through wet, sleepy little towns . . . Chicago, smoky, foggy, cold . . . Carey of Dallas, once A. M. A. prexy, now sessioning with aid of a cane . . . Killingsworth, old school-fellow of Ed., now resident at Children's Memorial in Chicago . . . to the Drake Thursday night. where met North Branch of Chicago Medical Society, addressed by Abell, Lee of Harvard, Fishbein, West . . . reminded of El Paso County meetings, with dinner first and gas afterward . . . Harbridge and Hamer of Phoenix, heads together, estimating and weighing . . . Scott, Ross, Thompson of Texas, huddled . . . old goats with beards, pontificating . . . Committee delays . . . red and gold garishness of the assembly room, outflashing Hollywood . . . the rubberneck ride through the loop and a flock of parks . . . ten thousand flunkeys to watch you breathe at Palmer House . . . the genial floor walker at Marshall Field, who admitted us before the store hours so a present for daughter Jacquelyn could be obtained . . . sessions of tobacco smoke and hot air, a most expansile gas . . . the three negro physicians, interested observers for their national association . . . editors of state journals, taking notes, lapelling big shots . . . Shoulders of Tennessee, very efficient as Speaker of the House . . . no sunshine in Chicago save a watery trickle under the shadow of the elevated once Saturday . . . the rapid nasal whine of the natives . . . the reporters from the big dailies, some getting the story and others just stabbing at it . . . cold and rain . . . the dispatch with which all matters fell into proper places when adjournment time came near . . . the growing swell of applause as measure after measure, controversial twenty-four hours before, was called up and passed . . . the climax, when tired Committee-men saw all their labors approved unanimously . . . the drama of realization that all America was receiving the news that America's physicians were still offering a helping hand . . . all standing hearing "sine die" . . . hands grasped, goodbyes said between men who may never

(Continued on page 422)

# IN DEPRESSIVE STATES

In depressive states, the suitability of 'Benzedrine Sulfate' (amphetamine sulfate, S.K.F.), as well as its correct dosage, must be determined for the individual patient.

Tentative classifications, however, suggest that 'Benzedrine Sulfate' is most likely to be of use in conditions characterized by diminution of capacity for activity, and that it is apt to be contraindicated in anxiety states accompanied by agitation. In depressive psychopathic states the patient should be institutionalized during the administration of 'Benzedrine Sulfate'.

Initial dosage should be small, ranging from a minimum of 2.5 mg. (¼ tablet) to 5 mg. (½ tablet). These should be regarded as test doses, and if no effect is obtained from the smallest amount given, the dosage may be progressively increased until a definite effect manifests itself. Usually it is unnecessary to give more than 10 mg. at a single dose. Careful medical supervision during this test period is particularly desirable.

When the correct dosage has been determined, it may be given two or three times a day, bearing in mind that administration in the late afternoon or evening may interfere with sleep. When divided doses are required, the specially grooved tablet may be broken and one-half or one-quarter tablet given.

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## SCRAPS

(Continued from page 420)

meet again . . . Children's Memorial Hospital and lovable Brenneman, the chief . . . the Empire Room for eating, dancing and listening . . . too cold for the Sox and Boston to play a double header . . . so away to a mad farce wherein the Marx brothers do crazier things than ever . . . rain and cold to the station . . . does the glorious sun ever shine in this province? . . . the Golden State Limited, warm, bright . . . off with little delay, headed back to blue skies and clean winds again . . . room-mate Felix Miller to stay behind for the Congress of Railway Surgeons . . . late to bed, after touring the great choo-choo house in Kansas City with Harbridge pointing out the perpetual flame atop Soldiers' and Sailors' monument . . . ever notice that a railroad man just can't watch a train pass without consulting his watch? . . . the morning's bright sun at last, warming the flat wheat lands of Kansas . . . Holt of Globe, homing from a long vacation in the middle-West . . . the old-maid teachers from the East squealing at sight of a "true cow-boy, so picturesque" . . . news of the ghastly wreck on the S. P. out in California . . . the mountains again . . . home and glad, with a memory of lots of constructive things accomplished in Chicago.

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